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Vol. 5, No. 4 3-4

LICENSEE CONTRACTOR AND VENDOR INSPECTION STATUS REPORT

QUARTERLY REPORT
OCTOBER 1981 - DECEMBER 1981

UNITED STATES NUCLEAR REGULATORY COMMISSION

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NUREG-0040
Vol. 5, No. 4

LICENSEE CONTRACTOR AND VENDOR INSPECTION STATUS REPORT

QUARTERLY REPORT
OCTOBER 1981 - DECEMBER 1981

Manuscript Completed: December 1981
Date Published: January 1982

Prepared by: Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

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PREFACE

A fundamental premise of the Nuclear Regulatory Commission's (NRC) nuclear facility licensing and inspection program is that a licensee is responsible for the proper construction and safe operation of nuclear power plants. The total government-industry system for the inspection of nuclear facilities has been designed to provide for multiple levels of inspection and verification. Licensees, contractors, and vendors each participate in a quality verification process in accordance with requirements prescribed by, or consistent with, NRC rules and regulations. The NRC inspects to determine whether its requirements are being met by a licensee and his contractors, while the great bulk of the inspection activity is performed by the industry within the framework of sequential, ongoing quality verification programs.

In implementing this multilayered approach, a licensee is responsible for developing a detailed quality assurance plan as part of his license application. This plan includes the quality assurance programs of the licensee's contractors and vendors. The NRC reviews the licensee's and contractor's quality assurance plans to determine that implementation of the proposed quality assurance program would be satisfactory and responsive to NRC regulations.

Firms designing nuclear steam supply systems, architect engineering firms doing design work on nuclear power plants, and certain selected vendors are currently inspected on a regular basis by the NRC. NRC inspectors, during periodic inspections, ascertain through direct observation of selected activities (including review of processes and selected hardware, discussions with employees and selected record review) whether a licensee or contractor is satisfactorily implementing a quality assurance program. If nonconformances with QA commitments are found, the inspected organization is requested to take appropriate corrective action and to institute preventive measures to preclude recurrence.

In addition to the QA program inspections, NRC also conducts reactive inspections of the licensee's contractors and vendors. These are special, limited scope inspections to verify that organizations supplying safety-related equipment or services to licensed facilities are exercising appropriate corrective/preventive measures when defects or conditions which could adversely affect the safe operation of such facilities are identified and that these organizations are complying with the NRC requirements which govern the evaluation and reporting of such conditions.

In the case of principal licensee contractors, such as nuclear steam supply system designers and architect engineering firms, the NRC encourages submittal of a description of corporate-wide quality assurance programs for review and acceptance by the NRC Office of Nuclear Reactor Regulation (NRR). Upon acceptance by NRR, described quality assurance programs provide written bases for inspection on a generic basis, rather than with respect to specific commitments made by a particular licensee. Once accepted by NRR, a corporate

quality assurance program of a licensee's contractor will be acceptable for all license applications that incorporate the program by reference in a Safety Analysis Report. In such cases, a contractor's quality assurance program will not be reviewed by NRR as part of the licensing review process, provided that the incorporation in the SAR is without change or modification. However, new or revised regulations, Regulatory Guides, or Standard Review Plans affecting quality assurance program controls may be applied by NRR to previously accepted quality assurance programs.

The NRC Region IV Office in Arlington, Texas, inspects the implementation of quality assurance programs of nuclear steam supply system designers and architect engineering firms which have been submitted to, and approved by, NRR in the form of Topical Reports or Standardized Programs. Upon completion of inspections confirming satisfactory implementation of QA programs, NRC will issue a confirming letter to the nuclear steam system supplier or architect engineering firm.

Licensees and applicants that have referenced the NRR approved Topical Report, or Standardized Program, in Safety Analysis Reports (or have adopted the total quality assurance program described in the Topical Report or Standardized Program) may, at their option, use the confirming letter to fulfill their obligation under 10 CFR Part 50, Appendix B, Criterion VII, that requires them to perform initial source evaluation audits and subsequent periodic audits to verify quality assurance program implementation. For additional details concerning the NRC letter, refer to "SAMPLE LETTER" included in this report.

Licensees or construction permit holders may choose not to make use of a contractor's NRC accepted program, or such an accepted program may not exist. In such cases, the Region IV inspections of nuclear steam supply system designers, architect engineering firms, or other licensee contractors, sub-tier contractors, or suppliers, will be based on programs developed to meet the commitments made by the licensee or construction permit holder. These Region IV inspections will not relieve the licensees or applicants from any inspection/verification responsibilities required by Criterion VII.

The NRC currently is continuing their evaluation of a proposed program for NRC acceptance of third-party (ASME) certification of Vendor Quality Assurance programs. Should the proposed program be endorsed by NRC, it is anticipated that, subject to NRC audits of the third-party program, licensees and applicants would be able to use the ASME nuclear certification and inspection system to fulfill that part of their obligation under 10 CFR Part 50, Appendix B, Criterion VII, which required them to perform initial source evaluation/selection audits and subsequent periodic audits to assess the quality assurance program implementation.

A third category of firms consists of organizations whose quality assurance programs or manufacturing processes have not been reviewed and approved by NRR, or by a third party (such as ASME). This category of firms is subject to NRC inspection based on the safety significance and performance of products or services provided by such firms. Since such firms will not receive a third-party review of their QA programs, results of the direct NRC inspections may not be used to fulfill the licensee's obligations under Criterion VII.

The White Book contains information normally used to establish a "qualified suppliers" list; however, the information contained in this document is not adequate, nor is it intended to stand by itself as a basis for qualification of suppliers.

Correspondence with contractors and vendors relative to the inspection data contained in the White Book is placed in the USNRC Public Document Room, located in Washington, D.C.

Copies of the White Book may be obtained at a nominal cost by writing to the National Technical Information Service, Springfield, Virginia 22161.

ORGANIZATION: COMPANY, DIVISION
CITY AND STATE

REPORT NO.: Docket/Year Sequence	**INSPECTION DATE(S):**	**INSPECTION ON-SITE HOURS:**

CORRESPONDENCE ADDRESS: Corporate Name
Division
ATTN: Name/Title
Address
City/State/Zip Code

ORGANIZATION CONTACT: Name/Title
TELEPHONE: Telephone Number

PRINCIPAL PRODUCT: Description of type of components equipment or services supplied.

NUCLEAR INDUSTRY ACTIVITY: Brief statement of scope of activity including percentage of organization effort, if applicable.

SAMPLE PAGE
(EXPLANATION OF FORMAT AND TERMINOLOGY)

ASSIGNED INSPECTOR: _____ _____
Name/VIB Section Date

OTHER INSPECTOR(S): Name/VIB Section

APPROVED BY: (Signature) _____ _____
Name/VIB Section Date

INSPECTION BASES AND SCOPE:

A. BASES: Pertain to the inspection criteria that are applicable to the activity being inspected and includes items such as 10 CFR Part 50, Appendix B, 10 CFR Part 21, and SAR or Topical Report commitments.

B. SCOPE: Summarizes the specific QA program areas that were reviewed, and/or identifies plant systems, equipment or specific components that were inspected. For reactive (identified problem) inspections, the scope summarized the problem that caused the inspection to be performed.

ORGANIZATION: COMPANY, DIVISION
CITY AND STATE

REPORT NO.:	INSPECTION RESULTS:	PAGE 2 of 2

A. VIOLATIONS: Shown here are any inspection results determined to be in violation of Federal Regulations (such as 10 CFR Part 21) that are applicable to the organization being inspected.

B. NONCONFORMANCES: Shown here are any inspection results determined to be in nonconformance with applicable commitments to NRC requirements. In addition to identifying the applicable NRC requirements, the specific industry codes and standards, company QA Manual sections, or operating procedures which are used to implement these commitments may be referenced.

C. UNRESOLVED ITEMS: Shown here are inspection results about which more information is required in order to determine whether they are acceptable items or whether a Violation or Nonconformance may exist. Such items will be resolved during subsequent inspections.

D. STATUS OF PREVIOUS INSPECTION FINDINGS: This section is used to identify the status of previously identified violations, items of Nonconformance and/or Unresolved Items until they are closed by appropriate action. For all such items, this section will indicate open/closed classification, identify the inspection report which first produced the item, describe the nature of the item, and if closed, include a brief statement concerning action which closed the item. If this section is omitted, all previous inspection findings have been closed.

E. OTHER FINDINGS OR COMMENTS: This section is used to provide significant information concerning the inspection areas identified under "Inspection Scope." Included are such items as mitigating circumstances concerning a Violation or Nonconformance, statements concerning the limitations or depth of inspection (Sample Size, type of review performed) and special circumstances or concerns identified for possible follow up. For reactive inspections, this section will be used to summarize the disposition or status of the condition or event which caused the inspection to be performed.

SAMPLE PAGE
(EXPLANATION OF FORMAT AND TERMINOLOGY)

CONTRACTORS WITH NRC LETTERS CONFIRMING QA PROGRAM IMPLEMENTATION

(SEE NEXT PAGE FOR EXAMPLE OF CONFIRMING LETTERS)

CONTRACTOR	TOPICAL REPORT	REVISION	DATE OF NRC LETTER
BABCOCK & WILCOX	BAW 10096A	REVISION 1	DECEMBER 30, 1975
STONE & WEBSTER	SWSQAP 1-74	REVISION A	DECEMBER 30, 1975
WESTINGHOUSE NTD	WCAP 8370	REVISION 9A	APRIL 30, 1981
BECHTEL-GAITHERSBURG	BQ-TOP-1	REVISION 2A	MARCH 16, 1981
BECHTEL-SAN FRANCSICO	BQ-TOP-1	REVISION 3A	JUNE 12, 1981
EBASCO SERVICES, INC.	ETR-1001	REVISION 8A	MARCH 31, 1980
COMBUSTION ENGINEERING	CENPD-210-A	REVISION 3	JUNE 2, 1981
GIBBS & HILL, INC.	GIBSAR 17-A	AMENDMENT 2	MARCH 31, 1977
UNITED ENGINEERS & CONSTRUCTORS	UEC-TR-001-3A	AMENDMENT 5	MARCH 31, 1977
GENERAL ELECTRIC CO.	NEDO-11209-04A	N/A	MARCH 30, 1979
SARGENT & LUNDY ENGINEERS	SL-TR-1A	REVISION 5	MAY 17, 1979
BECHTEL-LOS ANGELES	BQ-TOP-1	REVISION 2A	JUNE 5, 1979
GILBERT/COMMONWEALTH	GAI-TR-106	REVISION 2A	FEBRUARY 2, 1981
BECHTEL-ANN ARBOR	BQ-TOP-1	REVISION 2A	MAY 7, 1981

UNITED STATES

NUCLEAR REGULATORY COMMISSION

REGION IV

611 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TEXAS 76011

(Date)

"SAMPLE LETTER"

(ADDRESSEE)

Gentlemen:

A series of Nuclear Regulatory Commission (NRC) inspections have been conducted to review your implementation of the Quality Assurance Program applicable to NRC applicants or licensees who have contracted for services from the (applicable corporate entity). These inspections consisted of selective examination of procedures and representative records, interview of personnel, and direct observation by the inspectors. As a result of these inspections, the NRC has concluded that the QA program described in Topical Report _____ is being implemented satisfactorily. Neither this conclusion nor the remainder of this letter applies to manufacturing activities or construction related activities conducted at reactor sites.

Licensees and applicants that have referenced the above Topical Report in their Safety Analysis Reports (or have adopted the total quality assurance program described in that Topical Report) may, at their option, use this letter to fulfill their obligation under 10 CFR Part 50, Appendix B, Criterion VII, that requires them to perform initial source evaluation/ selection audits and subsequent periodic audits to assess the quality assurance program implementation.

The NRC expression of satisfaction with the implementation of your QA program does not assure that a specific product or service offered by you to your customer is of acceptable quality, nor does it relieve the applicant or licensee from the general provision of Criterion VII which requires verification that purchased material, equipment, or services conform to the procurement documents. It is recognized that in some cases this assurance can be made by the applicant or licensee without audits or inspections at your facility.

Continuing acceptability of implementation of your QA program is contingent upon your maintaining a satisfactory level of program implementation, certified through periodic NRC inspection, throughout all corporate organization units and nuclear projects encompassed by your program. Should your program implementation at any time be found unacceptable you will be notified by letter and requested to correct the deficiencies promptly. In the

event you fail to correct the deficiencies promptly, or if the record of deficiencies is such as to indicate generally poor program implementation, you and the applicants and licensees who have referenced your QA program will be notified that the generic implementation of your program is no longer acceptable to the NRC. All of the audit/inspection requirements of Criterion VII, Appendix B, 10 CFR Part 50, must then be implemented by the applicants or licensees. The NRC will reinstate its letter of acceptability of implementation of your QA program only after our inspectors have concluded, based on reinspection, that you have again demonstrated full compliance.

Except as noted above, the conclusions expressed in this letter will be effective for three years from the date of issue of the letter. At that time, program performance over the previous three year period will be evaluated and this letter reissued, if appropriate.

The results of our inspections are published quarterly in the Licensee Contractor and Vendor Inspection Status Report (NUREG 0040), which is made available to NRC facility applicants, licensees, contractors, and vendors, as well as to members of the public, by subscription.

Sincerely,

Regional Administrator

"SAMPLE LETTER"

ORGANIZATION: ACIMET MANUFACTURING
CLEVELAND, OHIO

REPORT NO.: 99900754/81-01	INSPECTION DATE(S): 9/14-18/81	INSPECTION ON-SITE HOURS: 31

CORRESPONDENCE ADDRESS: Acimet Manufacturing
ATTN: Mr. L. L. Logan
General Manager
1710 Clarkstone Road
Cleveland, Ohio 44112

ORGANIZATION CONTACT: Mr. T. E. Solomon, Manager, Quality Assurance
TELEPHONE: (216) 692-2250

PRINCIPAL PRODUCT: Nuclear Fasteners - Bolts, Studs, and Nuts

NUCLEAR INDUSTRY ACTIVITY: Acimet Manufacturing (AM) is currently providing fastener materials to at least five nuclear power generating stations.

ASSIGNED INSPECTOR: T. E. Ellershaw, Reactive Inspection Section (RIS) — Date: 11-10-81

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes, Chief, RIS — Date: 11-10-81

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made as a result of a 10 CFR Part 50.55(e) written notification by Tennessee Valley Authority pertaining to dimensional and marking deficiencies in studs and nuts provided to the Phipps Bend and Hartsville Nuclear Plants. Areas selected for inspection included: procurement control; heat treatment; equipment calibration; internal audits; and material identification and control.

A. VIOLATIONS:

1. Contrary to paragraph 21.6 of 10 CFR Part 21, posting of Section 206 of the Energy Reorganization Act of 1974 or an appropriate notice had not been accomplished.

2. Contrary to paragraph 21.21(a) of 10 CFR Part 21, procedures had not been adopted to provide for: (a) evaluating deviations or informing the licensee or purchaser; and (b) assuring that a director or responsible officer was informed if the supplied basic component (i) failed to comply, or (ii) contained a defect.

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50, QA Manual Section VII and paragraph NCA-3867.4(e) in Section III of the ASME Code:

   a. Acimet Manufacturing (AM) purchased finished bolting products for use in ASME Code Section III applications from an AM approved bolting material manufacturer. The material used came from a stock material manufacturer, through a material supplier, both of which had not been audited by AM nor were they holders of ASME Quality System Certificates.

   b. Verification of compliance of these materials with the material specification requirements had not been accomplished in accordance with the provisions of NCA-3867.4(e) in Section III of the ASME Code.

2. Contrary to Criterion V of Appendix B to 10 CFR 50 and Heat Treat Procedure No. 4.1, time in and time out was not recorded for hardening (austenitizing) and draw (tempering) phases of heat treatment, nor could it be verified that parts are not permitted to come to room temperature prior to tempering.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and QA Manual Section XII:

   a. Inspection equipment has not been calibrated at scheduled intervals; e.g., at least 12 working plug gages, scheduled for calibration in July 1981, had not been calibrated as of September 16, 1981, and were still in service.

   b. Master Jill Block Set No. 17 was scheduled for annual calibration during February 1981; however, it was not calibrated until June 8, 1981. The records showed that this set was removed from service on February 20, 1981, and not returned until June 10, 1981. However, review of calibration cards for working plug gages show that certain gages were calibrated by the use of Set No. 17 during April and May 1981.

c. Master Jill Block Set No. 89 was scheduled for annual calibration on May 1, 1981. The record showed that Set No. 89 was removed from the system on May 19, 1981, and calibrated on June 1, 1981. However, review of records for 16 working plug gages show that these gages were calibrated by the use of Set No. 89 after May 19, 1981, and before June 1, 1981.

d. Calibration of certain setting plugs could not be traced to National Bureau of Standards because AM failed to record the master set numbers used in calibrating these plugs.

e. Calibration record cards showed that actual, recorded calibration dimensions of at least six plug gages were out of tolerance, yet they were noted as being "O.K.," were not removed from service, and nonconformance reports were not generated.

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and QA Manual Section XVII, the seven internal audits conducted during August 1981 were performed by the General Manager who had not been trained as an observer on previous audits, nor had he received any other documented instructions or training by the Quality Assurance Manager.

C. Unresolved Items:

None

D. OTHER FINDINGS OR COMMENTS:

1. 10 CFR Part 50.55(e) Construction Deficiency Report

All identified discrepant material supplied by AM to the Hartsville and Phipps Bend Nuclear Plants has been reworked and/or replaced. AM's failure to identify the defects was a result of not performing specification review and the required inspections. The actions taken by AM to preclude recurrence included the following: termination of the responsible quality control personnel; incorporation into the QA Manual of document control and specification review requirements; and the establishment of acceptance criteria, prior to order entry, regarding gaging and inspection. The generic aspects could not be determined during this inspection due to the very limited amount of nuclear work being processed. However, the items identified in B.3 could have allowed the processing of other dimensional nonconformances.

2. Procurement Control

This area of the inspection consisted of a review of: five purchase orders placed by AM with various vendors; vendor audits performed by AM; certified material test reports related to the material received against the five purchase orders; and customer imposed requirements placed on AM. Nonconformance, Item B.1 was identified.

3. Heat Treatment

This area of the inspection consisted of a review of heat treat vendor qualifications, temperature uniformity survey records, heat treatment procedure for A193 Grade B7 bolting material, and heat treat charts. Nonconformance, Item B.2 was identified.

4. Equipment Calibration

This area of the inspection was performed by reviewing the Calibration Record Cards of 40 working plug and ring gages, and 2 master gage sets. Traceability of the master gage sets to National Bureau of Standards was established. Nonconformance, Item B.3 was identified.

5. Internal Audits

This area of the inspection was performed by reviewing the internal audits performed during 1981 (all of which were performed in August). The NRC inspector expressed concern about the internal audits, particularly the one dealing with equipment calibration, in which some of the very same elements that were identified by the NRC inspector as being nonconforming were checked off as being okay by AM's auditor. Nonconformance, Item B.4 was identified.

6. Material Identification and Control

This area of the inspection was performed by observation of stored bar stock, in-process material and finished products, and comparing the associated documentation with the identifying markings on the material/parts. There were no nonconformances or unresolved items identified.

ORGANIZATION: AMERACE CORPORATION - CONTROL PRODUCTS DIVISION
GRAFTON, WISCONSIN

REPORT NO.: 99900296/81-01	INSPECTION DATE(S): 8/31-9/4/81	INSPECTION ON-SITE HOURS: 28

CORRESPONDENCE ADDRESS: Amerace Corporation
Control Products Division
ATTN: Mr. B. Newman
President
2330 Vauxhall Road
Union, New Jersey 07083

ORGANIZATION CONTACT: Mr. M. Q. Martin, Manager - Quality Assurance
TELEPHONE: (414) 377-0800

PRINCIPAL PRODUCT: Time Delay Relays

NUCLEAR INDUSTRY ACTIVITY: Five percent

ASSIGNED INSPECTOR: I Barnes 10-14-81
for W. E. Foster, Reactive Inspection Section (RIS) Date

OTHER INSPECTOR(S):

APPROVED BY: I Barnes 10-14-81
I. Barnes, Chief, RIS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21; 10 CFR Part 50, Appendix B; and other applicable codes and standards.

B. SCOPE: This inspection was made as a result of the: (1) issuance of a 10 CFR Part 21 Report regarding premature time-out of 7000 Series pneumatic time delay relays located at the San Onofre Nuclear Generating Station, Units 2 and 3; (2) concerns regarding seismic qualification data of 7022 and 7024 relays at the V. C. Summer Nuclear Station, Unit 1; and (3) concerns regarding quality of relays furnished to General Electric Company, Nuclear Energy Business Group, for various nuclear generating stations.

Additionally, the following programmatic areas were also inspected: (1) Implementtion of 10 CFR Part 21; (2) Change Control; and (3) Follow up on Previous Inspection Findings.

A. VIOLATIONS:

None

B. NONCONFORMANCE:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50, subparagraphs 6.3.3.2 and .3 of Section No. Q1.6.0, dated November 22, 1978, of the Quality Assurance Manual, Process Procedure No. PS-15, dated July 16, 1980, had not been reviewed and approved prior to its distribution to the Lenape Ultrasonic Cleaner/Degreaser.

   Prior to the conclusion of the inspection, the following events occurred: (1) Engineering Change Order No. 81-154 was approved and issued; (2) Process Procedure No. PS-15, Revision C, dated September 1981 was reviewed and approved; and (3) the NRC inspector was provided a letter which contained corrective and preventive action statements. As a result of the foregoing, further written response to this item is not required.

2. Contrary to Criteron V of Appendix B to 10 CFR Part 50, and paragraphs 6.2.3.8 and 6.3.3.10 of Engineering Procedure No. E1200, dated September 19, 1980:

   a. The following Advance Engineering Release Notices (XERNs) had been released but had not been signed by the Product Engineer: XERN Nos. 379, dated November 6, 1980; 380, dated November 13, 1980; 397, dated April 16, 1981; 405, dated July 8, 1981; and 410, dated August 24, 1981.

   b. The following Engineering Release Notices (ERNs) had been released, exhibited an X and a typed name for: Manufacturing, Quality Assurance, Production Control, and Purchasing; however, approved signatures had not been obtained: ERN Nos. 384, dated January 16, 1981; 385, dated February 5, 1981; 401, dated June 5, 1981; and 407, dated July 17, 1981.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Deviation (78-01): Necessary information had not been added to the calibration schedules for mechanical inspection and test equipment. Additionally, standards and calibration frequencies had not been specified in calibration procedures for electronic equipment.

   The inspector verified that calibration schedules and calibration methods had been completed in accordance with applicable requirements.

2. (Closed) Deviation (78-01): Instructions and procedures had not been prepared for issuance, control, and review of inspection procedures.

   The inspector verified that QA Operating Procedures, Nos. Q2.6.1 and Q2.7.2, dated August 1 and July 27, 1979, respectively, had been prepared to control issuance of inspection procedures.

E. OTHER FINDINGS OR COMMENTS

1. Premature Time-Out Problem - The manufacturer attributed the premature time-out problem of the 7000 Series time delay relays to contamination on the diaphragm coupler. The contamination was induced in the manufacturing process and prevented proper seating of the diaphragm, causing a leak and resulting in premature time-out of the relays. It was determined that the contaminant was compressor lubricant (silicon) in the air line used to blow-off the parts during manufacturing. The manufacturer's letter, dated March 5, 1981, to Bechtel Power Corporation, Los Angeles, California, states in part, "The following corrective action was taken: 1 - The written manufacturing instructions have been revised to call out 'Filtered Air Only' for blow-off operations. 2 - An ultra-sonic cleaning operation has been added to the manufacturing procedure. 3 - A visual inspection has been added to check for the presence of contaminants."

   The inspector verified that: (1) documented instructions require ultrasonic cleaning and visual inspection; and (2) ultrasonic cleaning equipment was installed. The inspector was informed that revised manufacturing instructions, for filtered air, were located at the supplier of the diaphragm coupler; consequently, this could not be verified. However, the inspector was provided copies of interoffice memoranda of the supplier which addressed air used for blowing off parts.

2. Seismic Qualification Data (Contact Chatter) - The manufacturer was not aware of concerns in this area prior to arrangments for this inspection. Their investigation revealed the concerns were related to the location of their devices in panels supplied by the Switchgear Division of General Electric Company. Inasmuch as the concerns were related to the supplier of the panels, no corrective action was required at Control Products Division.

ORGANIZATION: AMERACE CORPORATION - CONTROL PRODUCTS DIVISION
GRAFTON, WISCONSIN

REPORT NO.: 99900296/81-01	INSPECTION RESULTS:	PAGE 4 of 4

3. Quality of Relays (120 AC Volt Response Time) Furnished to General Electric Company, Nuclear Energy Division (GE-NED) - Technical Bulletin No. CR-1, dated September 1980, contains the following statement: "Between de-energizing and opening of normally open contacts/ less than 70 milliseconds on A.C. and less than 8 milliseconds on D.C." Apparently, this has always been the requirement. GE-NED ordered relays to their Drawing No. 164C5258 with the following requirement: "AC Energized Relay Release Time of Normally Open Contacts - 42 milliseconds." Control Products Division initiated a requalification program with one of the parameters identified as the 42 millisecond requirement. The data showed an excursion of 33 to 47 milliseconds. Subsequent meetings with GE-NED has resulted in the following revision to GE-NED Drawing No. 164C5258: "AC Energized Relay Release Time of Normally Open Contacts - 60 milliseconds."

   The inspector was informed that the response time of opening normally open contacts is a design criteria which is not periodically verified; however, it would be verified if the design changed. Based on the foregoing, completion of the Certification of Compliance and acceptance of the hardware ordered by GE-NED Purchase Order No. 282-kc915, was in order.

ORGANIZATION: ANACONDA-ERICCSON COMPANY
CONTINENTAL WIRE AND CABLE
YORK, PENNSYLVANIA

REPORT NO.: 99900372/81-01	INSPECTION DATE(S): 9/15-18/81	INSPECTION ON-SITE HOURS: 25

CORRESPONDENCE ADDRESS: Anaconda-Ericcson Company
Wire and Cable Division
ATTN: Mr. D. O. Bostrom
Manager, Quality Assurance
East 8th Street
Marion, Indiana 46952

ORGANIZATION CONTACT: Mr. A. M. Coggeshall, Plant QA Manager
TELEPHONE: 717-792-2644

PRINCIPAL PRODUCT: High Temperature Electrical Wire and Cable

NUCLEAR INDUSTRY ACTIVITY: Approximately seven percent of the Continental Wire and Cable plant sales are for the nuclear industry.

ASSIGNED INSPECTOR: [signature] 10-19-81
R. E. Oller, Components Section (CS) Date

OTHER INSPECTOR(S):

APPROVED BY: [signature] 10-19-81
U. Potapovs, Acting Chief, CS Date

INSPECTION BASES AND SCOPE:

1. BASES: 10 CFR Part 50, Appendix B; and 10 CFR Part 21.

2. SCOPE: Status of previous inspection findings; manufacturing process control; change control; nonconformances and corrective action; and 10 CFR Part 21.

ORGANIZATION: ANACONDA-ERICCSON COMPANY
CONTINENTAL WIRE AND CABLE
YORK, PENNSYLVANIA

REPORT NO.: 99900372/81-01	INSPECTION RESULTS:	PAGE 2 of 5

A. VIOLATIONS:

None

B. NONCONFORMANCES:

Contrary to the corrective action commitment in the Anaconda-Ericcson response letter dated September 12, 1979, 17 procedures, identified in the Manufacturing Instruction No. 8, dated August 12, 1976, an index for instructions applicable to extrusion equipment, had not been written.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Deviation A (79-01): It appeared from paragraphs 5.1., 1.11.1., and Exhibit No. 1 of the Anaconda Topical Report AWC-75-A, Revision 1, that the Plant QA Manager reported to a position level equivalent to the Plant Manager, however, the person to whom he reported; i.e., the Power Cable Manager of Quality Assurance, did not have total responsibility for a manufacturing facility.

   The inspector verified that in accordance with Anaconda's response letter dated September 12, 1979, the Topical Report AWC-75-A, Revision 1, was revised to clarify the above condition. The current Revision 3 of the topical report, paragraph 1.4., "Plant Quality Assurance," and Exhibit 1, now describes the Plant QA manager as reporting to the Plant Manager for administrative operation of his department, and to the Wire and Cable Division Manager of QA for functional operation of his department. This arrangement allows him sufficient authority to assure that quality requirements are maintained.

2. (Closed) Deviation B (79-01): It appears that Inspection Proceudre No. 524, dated April 6, 1978, had not been reviewed and approved by the York Plant prior to issue as required by paragraphs 2.4.1. and 2.4.5. of the Anaconda Topical Report AWC-75-A, Revision 1.

   The inspector verified that, as a result of further information supplied in Anaconda's response letter dated September 12, 1979, review of paragraphs 6.1 and 6.1.1. of the topical report and discussions, that the above matter is no longer considered a deviation. The Wire and Cable Division Manager-QA has responsibility for final approval of new or revised inspection procedures. Review and comment copies are sent to the Plant QA Manager and then returned to the Wire and Cable Division Manager-QA. He then signs and issues the final approved copy to the Plant QA Manager.

3. (Closed) Deviation C (79-01): It appeared that five test methods had not been reviewed and approved by the York Plant prior to issue as required by paragraphs 2.5.1. and 2.5.5. of the Anaconda Topical Report AWC-75-A, Revision 1.

   The inspector verified that, as a result of further information supplied in Anaconda's response letter dated September 12, 1979, review of paragraphs 6.1. and 6.1.1. of the topical report and discussions that this matter is no longer considered a deviation. Test methods are reviewed and approved in the same manner as for inspection procedures as previously identified.

4. (Closed) Deviation D (79-01): Failure by the Chief or Senior Specification Engineer and the QA Manager to initial, as approved, on five Engineering Notices (ENs) as required by paragraph 3.2.3. of the Anaconda Topical Report AWC-75-A, Revision 1.

   The inspector verified that in accordance with Anaconda's response letter, dated September 12, 1979, the forms for the ENS and Standard Instructions (SIs) manufacturing process tags used at the York Plant, have been revised by adding dated signoff blocks for initialing by the Plant QA Manager, Engineering Supervisor and the Specification Engineer. Review of six current EN process tags for safety related orders, verified that these tags were properly initialed.

5. (Closed) Deviation E (79-01): Failure to properly complete the fronts and/or backs of Production Tags for five traceability items, as required by paragraph III.e. of Inspection Standard Practice No. 2000.

   The inspector verified that in accordance with Anaconda's response letters dated September 12, 1979 and February 19, 1980, that to prevent failure by test and production personnel to complete the required entries, new tags, with all of the requirements on one side only, have been put into use, and personnel have been reinstructed in their use. The Standard Practice No. 2000 has been replaced by Standard Practice SP-2012, dated June 11, 1981, "Traceability." Observations in the shop verified that the new production tags are beging completed as required.

6. (Open) Deviation F (79-01): Failure to provide 17 procedures (instructions) for inprocess control of extrusion equipment identified in Manufacturing Instruction No. 8, Section 0 Index, and required by paragraph 5.1. and its subparagraph "a." of the Anaconda Topical Report AWC-75-A, Revision 1.

   The inspector determined that contrary to Anaconda's commitment in their response letter, dated September 12, 1979, that the 17 procedures applicable to extrusion equipment, have not been written. See Notice of Nonconformance.

7. (Closed) Deviation G (79-01): Failure by the Chief or Senior Specification Engineer to initial as approved, five ENs prior to distribution, as required by paragraph 3.5.1. of the Anaconda Topical Report AWC-75-A, Revision 1.

   The inspector verified that in accordance with Anaconda's response letters dated September 12, 1979, and February 19, 1980, that the same corrective action as taken for the previous Deviation D has been implemented for this matter.

E. OTHER FINDINGS OR COMMENTS

1. Manufacturing Process Control - The inspector reviewed five sections of the Anaconda-Ericcson Topical Report AWC-75-A, Revision 3, which were applicable to material receiving, manufacturing, and inspection and test, of high temperature electrical cables.

   Observations were made of inprocess work on single and multiconductor cables including receiving inspection, insulating, cabling, shielding, low-voltage testing, and final electrical testing.

   Review included: two customer's order documents; an overall inspection and test procedure; nine manufacturing process tags attached to reels of cable in various stages of inspection and test, and the related reports.

   Within this area, no nonconformances to NRC, customer order or QA program requirements were identified, and no unresolved items were identified.

2. Change Control - The inspector reviewed Section 3.0, "Design Control," of the AE Topical Report AWC-75-A, Revision 3, which was applicable to changes in design and manufacturing process activities.

   A review was made of three Standard Practice Procedures and the related change records covering: Engineering Change Notice Control, Production Deviation Reports and QA Test Sheet changes to verify that changes in engineering and production activities which resulted from customer requests, engineering review, production deviations, and QA electrical tests and inspections, were adequately controlled. The records reviewed included original and revised manufacturing process EN and SI tags, Engineering Change Notices, Customer Change Requests, Production Deviation Reports, original and revised Electrical Test Sheet records.

   Within this area, no nonconformances to NRC, customer order, or QA program requirements were identified.

3. Nonconformances and Corrective Action - The inspector reviewed two sections of the AE Topical Report AWC-75-A, Revision 3, which were applicable to the control and disposition of deficiencies in inprocess electrical cables and those long-term deficient conditions which required disposition by the Corrective Action Committee.

To verify that nonconforming items were reviewed and accepted, rejected, repaired or reworked, and that conditions adverse to quality, including the cause, are promptly identified and corrected, a review was made of: seven stop tags attached to reels of cables segregated in "Stop Tag" hold areas, and the related records. The records included seven Notice of Nonconforming Material Reports and other pertinent records. Review also included ten reports of Material Review Board Meetings for the period of August 28, 1981 through September 9, 1981, and one log sheet covering six reports of Corrective Action Committee Meeting actions for the period of March 20, 1981 through May 22, 1981.

Within this area, no nonconformances to NRC, customer order, or QA program requirements were identified, and no unresolved items were identified.

4. 10 CFR Part 21 - The inspector reviewed the AE Procedure No. WCP-01, dated June 2, 1981, to verify that documented measures were available to meet the reporting requirements of 10 CFR Part 21.

   Observations were made of the bulletin board where posted copies of Article 206 of the Energy Reorganization Act of 1974, and the above AE Procedure No. WCP-01 were maintained.

   Within this area, no violations were identified.

ORGANIZATION: BABCOCK AND WILCOX COMPANY
NUCLEAR POWER GENERATION DIVISION
LYNCHBURG, VIRGINIA

REPORT NO.: 99900400/81-02	INSPECTION DATE(S): 9/15-18/81	INSPECTION ON-SITE HOURS: 32

CORRESPONDENCE ADDRESS: The Babcock and Wilcox Company
Nuclear Power Generation Division
ATTN: Mr. D. E. Guilbert
Vice President and General Manager
P. O. Box 1260
Lynchburg, VA 24505

ORGANIZATION CONTACT: Mr. E. L. Davis, QA Manager
TELEPHONE: (804) 385-2895

PRINCIPAL PRODUCT: Nuclear Steam Supply Systems, engineering services and operating plant support.

NUCLEAR INDUSTRY ACTIVITY: The total effort committed to domestic nuclear activities is approximately 88% of the 1,300 employees of the Nuclear Power Generation Division. Principal activities include the design and procurement of nine projects; Bellefonte, Midland, Washington Public Power Supply System, North Anna, and Pebble Springs Nuclear Power Plant, and providing engineering services under 129 service contracts and 38 fuel reload contracts.

ASSIGNED INSPECTOR: D F Fox — 10/23/81
D. F. Fox, Reactor Systems Section (RSS) — Date

OTHER INSPECTOR(S):

APPROVED BY: C J Hale — 10-26-81
C. J. Hale, Chief, RSS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21, 10 CFR Part 50, Appendix B and Topical Report BAW-10096A.

B. SCOPE: 10 CFR Part 21 inspection, design inspection, status of previous inspection findings, and response to a regional item (analysis of reactor coolant system piping did not consider consequences of failure of miscellaneous instrument piping).

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

The recently appointed QA Manager does not appear to possess the minimum qualifications that are delineated in the NRC approved revision of the B&W Topical Report for the position. The Topical Report was subsequently revised to reflect his qualifications and submitted to NRC Headquarters for approval. This item is considered unresolved pending NRC action on the proposed revision.

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Nonconformance (81-01): A Certificate of Conformance and the associated Quality Assurance Data Package approval sheet were marked up without exhibiting the initials of the person marking the document nor the date of the mark-up.

   The affected documents were reviewed, revised, and reissued in accordance with procedures. The individuals involved in the processing of QA Data Packages were re-instructed that changes to them can only be made by a formal revision of the package. A random check of twenty other packages by B&W Quality Assurance did not reveal any other instances where changes were improperly made.

2. (Closed) Nonconformance (81-01): Personnel qualification records were not collected nor maintained as required.

   Procedure NPG-1406-10G was revised to include specific requirements for verification and documentation of the education and experience of professional employees hired after May 1, 1981. The 1E1 Manual was revised to define the media, location, and storage duration of personnel qualification records. A formal internal QA audit for compliance with the requirements is scheduled for the week of November 1, 1981; however, a random check of records of recently hired employees indicated that the applicable requirements are currently being implemented. B&W management stated that the capability of personnel hired prior to May 1, 1981, to satisfactorily perform activities affecting quality, will be objectively evaluated during the 1981 Performance Appraisal Program scheduled for execution October 1 through December 15, 1981.

3. (Closed) Nonconformance (81-01): Personnel training records were not collected nor maintained as required.

   NPGD new employee orientation records were updated and on-the-job training (OJT) records for employees hired after May 1, 1981, are now being collected

and maintained as required. A formal QA audit for compliance with the requirements is scheduled for the week of November 1, 1981. B&W management stated that retrofit of OJT records for employees hired prior to May 1, 1981, is not considered necessary since the impending 1981 Performance Appraisal Program will assess the effectiveness of this training.

4. (Closed) Unresolved Item (81-01): It could not be determined that the quality assurance program requirements imposed by B&W on suppliers of spare or replacement safety related parts meet current NRC requirements.

   The specific QA program requirements that are imposed by B&W on each supplier of spare and replacement parts, as a minimum, envelop all of the specific requirements to which the licensee is committed. The currently in-place B&W program appears to be consistent with guidance obtained from I&E Headquarters.

E. OTHER FINDINGS OR COMMENTS:

1. 10 CFR Part 21 Inspection - Five safety concerns processed by B&W prior to NRC inspection 80-03, were transmitted to NRC, RIV for review by B&W letter to NRC, RIV dated March 18, 1981. NRC letter dated April 27, 1981, acknowledged their receipt and indicated that they would be reviewed during future inspections.

   The concerns related to: (a) the unacceptable fuel/clad temperatures that may occur in the event that the reactor coolant pumps were tripped during a small break LOCA (16-79); (b) the failure of the pressurizer heaters that may occur in the event they become uncovered (43-79); (c) the failure of non B&W supplied reactor vessel skirt anchor bolting (16-80); (d) the lack of conservation in the calculated beginning of life pressure in fuel pins (19-80); and (e) the apparent inability of power operated relief valves to reliably close after passing liquid or two phase flow (41-80).

   B&W concluded that each of these concerns were not reportable to NRC by B&W on the basis that the NRC was adequately informed of each of them. The NRC inspector determined that in all cases some organizational unit in the NRC was informed of the concern by either B&W or by an affected licensee. B&W acted in accordance with their 10 CFR Part 21 implementing procedure that was in place when the concerns were processed.

   Subsequent to NRC inspection 80-03, B&W revised their procedure for processing safety concerns and issued a new procedure for implementing the requirements of 10 CFR Part 21. B&W management reaffirmed their policy that safety concerns will be timely processed, evaluated, and documented, and that those safety concerns determined by B&W to constitute substantial safety hazards in systems or components within the B&W scope of supply will be reported to NRC and to all affected customers in a timely manner.

2. Design Inspection - The B&W Topical Report, the related sections of the

Bellefonte FSAR and applicable implementing procedures were examined to determine the commitments concerning safety related design activities. Four system descriptions and functional requirements documents, five specifications, 12 calculations, six drawings, eight preliminary safety concerns, ten internal and external memoranda, and other documentation relating to the reactor coolant system were examined to verify effective implementation. Within the scope of the inspection, the committed program was being implemented.

3. Regional Item (Deficiency in Reactor Coolant System Piping) - Review of available documentation and interviews with engineering and management personnel indicate that the consequential effects of reactor coolant piping displacements, jet impingments, and primary and secondary missiles on the assumed integrity of certain vital piping and instrumentation lines connected to the reactor coolant system, were apparently omitted from the LOCA analyses of B&W plants. The deficiency could result in an unanalyzed accident in the event of a LOCA.

   B&W notified all owners of B&W NSSSs that certain inconsistencies exist in the assumptions used in the thermal hydraulic analysis and in the structural integrity analysis of the effects of various LOCAs.

   B&W has completed approximately three-fourths of the analyses that are within their scope of supply for plants under construction and are waiting for directions from licensees with operating units to proceed with analyses that are specific to their units.

   This deficiency appears to have resulted from a considered engineering judgment, made early in the evaluation of the design, to omit what was considered at that time to be "second order" effects from the ECCS analysis. It did not appear to result from a breakdown of the B&W QA program. To reduce the likelihood of other "potential design deficiencies" from occurring in the future, B&W has instituted a formal design review program. This program provides for a multi-disciplined overview of selected designs that is independent of the programmatic component and systems oriented reviews normally performed by B&W on all safety related designs.

ORGANIZATION: BECHTEL POWER CORPORATION, ANN ARBOR POWER DIVISION
ANN ARBOR, MICHIGAN

REPORT NO.: 99900501/81-02	INSPECTION DATE(S): 9/15-18/81	INSPECTION ON-SITE HOURS: 29.5

CORRESPONDENCE ADDRESS: Bechtel Power Corporation
Ann Arbor Power Division
ATTN: Mr. H. W. Wahl
Vice President and
General Manager
777 East Eisenhower Parkway
Ann Arbor, Michigan 48106

ORGANIZATION CONTACT: Mr. W. D. Greenwell
TELEPHONE: (313) 994-7223

PRINCIPAL PRODUCT: Architect Engineering Services

NUCLEAR INDUSTRY ACTIVITY: The total effort committed to domestic nuclear activities is approximately 64% of the 1800 person staff at the Ann Arbor Power Division. The divison currently provides the principal architect engineering services for two domestic units, Midland, Units 1 and 2, and has modification/repair/service contracts on ten additional reactor units.

ASSIGNED INSPECTOR: R. H. Brickley
R. H. Brickley, Reactor Systems Section (RSS) — Date: 10/9/81

OTHER INSPECTOR(S):

APPROVED BY: C. J. Hale
C. J. Hale, Chief, RSS — Date: 10-1-81

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21; 10 CFR Part 50, Appendix B; and Topical Report No. BQ-TOP-1.

B. SCOPE: Compliance with 10 CFR Part 21, design document control, and status of previous inspection findings.

ORGANIZATION: BECHTEL POWER CORPORATION, ANN ARBOR POWER DIVISION
ANN ARBOR, MICHIGAN

REPORT NO.: 99900501/81-02	INSPECTION RESULTS:	PAGE 2 of 2

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

(Closed) Nonconformance (81-01): The Drawing Control and Material Requisition/ Specification Logs (CEBUS) have not been updated and issued on a monthly basis.

The CEBUS Log was updated and issued at the time of the inspection, an investigation isolated the nonconformance to the Midland Project, an Administrative Services Supervisor has been assigned CEBUS operations responsibility, and two additional CEBUS operators have been assigned to maintain schedule outputs.

E. OTHER FINDINGS OR COMMENTS

1. 10 CFR Part 21 - One Division Instruction, two Manager of Engineering Directives (MEDs), and six Engineering Department Procedures (EDPs) were examined to determine that the requirements of 10 CFR Part 21 are being procedurally implemented. Three Management Corrective Action Reports, that were evaluated for 10 CFR Part 21 reportability; three bulletin boards; four purchase orders; and two nonconformance reports were examined for compliance with 10 CFR Part 21. It was determined that the requirements of 10 CFR Part 21 had been translated into procedures that had been implemented for those activities examined.

2. Design Document Control - Ten EDPs and their associated MEDs and Engineering Department Project Instructions were examined to determine if commitments made in Topical Report BQ-TOP-1, Rev. 1 (applicable to the Midland Project) had been translated into implementing procedures. One Drawing Control Log, one Procurement Document Register, one Master Distribution Schedule, five specifications, six drawings, one material requisition, twelve receipt copies of transmittal forms (for five specifications, six drawings, and one material requisition), and files maintained by six departments were examined for implementation of procedural requirements for design document control. It was determined that commitments had been translated into procedures that were implemented for the documents examined. However, it was noted that clarification is needed regarding the use of the receipt system for internal distribution of design documents and the controls imposed on the use of a disciplines design document that is distributed to and maintained in the files of a different discipline. Bechtel's clarification of these items will be followed up during a future inspection.

ORGANIZATION: BECHTEL POWER CORPORATION
GAITHERSBURG POWER DIVISION
GAITHERSBURG, MARYLAND

REPORT NO.: 99900519/81-04	INSPECTION DATE(S): 11/2-5/81	INSPECTION ON-SITE HOURS: 28

CORRESPONDENCE ADDRESS: Bechtel Power Corporation
Gaithersburg Power Division
ATTN: Mr. J. M. Komes, Vice President and
General Manager
15740 Shady Grove Road
Gaithersburg, MD 20760

ORGANIZATION CONTACT: Mr. D. C. Kansal, QA Manager
TELEPHONE: (301) 258-3776

PRINCIPAL PRODUCT: Architect Engineering Services

NUCLEAR INDUSTRY ACTIVITY: The Gaithersburg Power Division has a total of 2767 employees of which 2248 or 81% are assigned to nuclear projects. Major projects include Callaway Units 1 and 2, Wolf Creek Unit 1, and Grand Gulf Units 1 and 2. There are also modification/repair/service contracts on 14 additional reactor units.

ASSIGNED INSPECTOR: C. J. Hale for 12-4-81
J. R. Costello, Reactor Systems Section (RSS) Date

OTHER INSPECTOR(S):

APPROVED BY: C. J. Hale 12-4-81
C. J. Hale, Chief, RSS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B; SNUPPS PSAR, Chapter 17; and Grand Gulf PSAR, Chapter 17.

B. SCOPE: Design input, design verification, and action on two regional requests:

(1) incorrect beam sizes for electrical trays, Grand Gulf; and

(2) pipe whip restraint design discrepancies, SNUPPS.

ORGANIZATION: BECHTEL POWER CORPORATION
GAITHERSBURG POWER DIVISION
GAITHERSBURG, MARYLAND

REPORT NO.: 99900519/81-04	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Design Input and Design Verification - SNUPPS PSAR Chapter 17, Grand Gulf PSAR Chapter 17, Engineering Department and Engineering Project Procedures were examined to determine quality assurance program commitments. To verify implementation of these commitments, the following documents were examined: 3 design criteria documents, 13 drawings, 3 system descriptions, 14 calculations, 1 project summary "Q" list, 1 design review notice, 2 design control check lists, 1 licensing commitment tracking system, and 6 specifications. Relative to the documents examined, all procedural commitments were being properly implemented.

2. Construction Deficiency Report - Incorrect Beam Sizes for Electrical Trays.

   Mississippi Power and Light Company (Grand Gulf) reported to Region II that an Architect Engineering (AE) reevaluation had determined that incorrect beam sizes for electrical seismic Class I tray supports were purchased and installed at 76 tray locations. The purpose of this inspection was to determine if this was a generic problem and if there was a breakdown in the AE's quality program. Examination of drawing C-1415A, Revision 18, "Auxiliary Building Electrical Tray Supports Typical Standard Details," showed that the drawing had correctly stated the requirements. The error was made when Bechtel construction site personnel incorrectly translated the requirements from drawing C-1415A to their fabrication requests. The site personnel discovered the error and took appropriate corrective and preventive action. Since Grand Gulf is the only Gaithersburg Power Division (GPD) construction project, this item has no further generic potential at GPD. Management Corrective Action Request (MCAR 35) was issued August 20, 1981, to alert other Bechtel power divisions of a similar potential problem. The error appears to have been the fault of one individual onsite that failed to consider a necessary note on the design drawing (C-1415A). No further action at GPD appears warranted.

3. Pipe Whip Restraint Design Deficiencies.

   The purpose of this inspection was to determineif there had been a breakdown in the Bechtel GPD design process.

During an internal design review by Bechtel GPD of the SNUPPS "Design Guide for Pipe Whip Restraints," a discrepancy was identified between this Design Guide and Bechtel's BN-TOP-2, "Design for Pipe Break Effects." The discrepancy involved the absence in the Design Guide of the requirement for an energy balance analysis in the design of pipe whip restraints in those cases where the formation of a plastic moment in the pipe could not be prevented. This discrepancy was reported as a 10 CFR 50.55(e) item by SNUPPS to Regions III and IV.

A method had been developed by SNUPPS project engineering personnel which was considered superior for those cases where a plastic hinge is developed. During the internal Bechtel design review, the consensus was that this method was not conservative enough, was in violation of BN-TOP-2, and did not provide for the increase of size of the energy absorbing material or the U-bolt diameter of the Pipe Whip Restraints (increase in size was caused by rounding off dimensions for commercial procurement).

The method developed by SNUPPS project engineering personnel had several unquantified conservatisms which, if evaluated, may have shown the restraints were adequate. However, such an analysis was not performed, instead 103 of the 242 restraints issued for construction were reanalyzed using the energy balance technique, and/or the lumped-mass dynamic model, and 44 restraints were revised. Both the FSAR and the Design Guide were revised to allow for the formation of plastic hinges within acceptable ductility ratios in pipe whip restraints and to permit the use of dynamic analysis in pipe whip restraint design as an alternate to the energy balance technique.

No nonconformances or unresolved items were identified in this area of the inspection.

ORGANIZATION: BECHTEL POWER CORPORATION, LOS ANGELES POWER DIVISION
NORWALK, CALIFORNIA

REPORT NO.: 99900521/81-02	INSPECTION DATE(S): 9/28-10/1/81	INSPECTION ON-SITE HOURS: 58

CORRESPONDENCE ADDRESS: Bechtel Power Corporation
Los Angeles Power Division
ATTN: Mr. J. V. Morowski
Vice President and General Manager
P.O. Box 60680, Terminal Annex
Los Angeles, CA 90060

ORGANIZATION CONTACT: Mr. R. L. Patterson, QA Manager
TELEPHONE: (213) 864-6011, Ext. 2061

PRINCIPAL PRODUCT: Architect Engineering Services

NUCLEAR INDUSTRY ACTIVITY: The Los Angeles Power Division of the Bechtel Power Corporation is the architect engineer for seven domestic reactor units. Fifty percent of the total personnel (approximately 7,700) are assigned to activities in connection with these units.

ASSIGNED INSPECTOR: R. H. Brickley — 10/28/81
R. H. Brickley, Reactor Systems Section (RSS) — Date

OTHER INSPECTOR(S): J. R. Costello, RSS

APPROVED BY: C. J. Hale — 10/28/81
C. J. Hale, Chief, RSS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B, and Topical Report No. BQ-TOP-1.

B. SCOPE: Design process management, procurement source selection, procurement document control, evaluation of supplier performance, and status of previous inspection findings.

ORGANIZATION: BECHTEL POWER CORPORATION, LOS ANGELES POWER DIVISION
NORWALK, CALIFORNIA

REPORT NO.: 99900521/81-02	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCES:

Contrary to Criterion III of 10 CFR Part 50, Appendix B, and Appendix 17A of the Alvin W. Vogtle Nuclear Power Plant (VNP) PSAR, Bechtel has revised Section 17 of the VNP Project Reference Manual to allow Georgia Power Company field operations to make changes to approved engineering drawings, specifications, or other design documents without prior Bechtel Project Engineering approval.

C. UNRESOLVED ITEMS:

It is not apparent that the requirements for independent verification of engineering specifications is being properly implemented. IP-4.6 (Project Material Requisitions and Specifications) requires an independent verification by an engineer who has a level of design capability sufficient to have originated the specification. Present documentation of design specification reviews does not clearly identify the independent reviewer.

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Nonconformances (81-01): Computer program NE 155 (JET 2) did not show evidence of review and approval of the User's Manual, Theoretical Manual, and Verification Report.

   The User's Manual, Theoretical Manual, and Verification Report have been reviewed and approved and each computer program sponsor has been required to recheck and confirm that the required documentation is completed and forwarded to the Data Processing Library.

2. (Closed) Nonconformance (81-01): All project personnel were not receiving the LAPD QA Indoctrination Program training as required by procedures.

   The monthly "Exception Reports" identifying personnel that require training are being issued, affected personnel and their supervisors notified of the manditory requirement, and training sessions are being conducted.

E. OTHER FINDINGS OR COMMENTS:

1. Design Process Management - Section 17 of the VNP-PSAR and applicable procedures were examined to determine that a system for design process management had been prescribed which is consistent with the commitments of the Bechtel quality assurance program. The following documents were examined to determine that the design process procedures were being properly and effectively implemented: one design criteria manual, detailed design criteria, one system description, one specification, two SAR changes, 12 document review notices, five calculations, five drawings and the minutes of three review meetings. Relative to the documents examined, one nonconformance and one unresolved item were identified (See B. and C. above).

2. Procurement Source Selection - Applicable procedures/sections from the Procurement Supplier Quality Manual, Engineering Department Procedures Manual, and project procedures for two projects were examined to ascertain that procedures had been prepared and approved that prescribe a system for procurement source selection, bid evaluation and contract award consistent with QA Program commitments. Records maintained on the source selection, bid evaluation, and contract award involving five safety related contracts for two projects were examined. It was determined that these activities had been conducted in conformance with procedural requirements.

3. Procurement Document Control - Applicable procedures/sections from the Procurement Supplier Quality Manual Engineering Department Procedures Manual, and project procedures for two projects were examined to ascertain that procedures have been prepared and approved that prescribe a system for procurement document control which are consistent with QA Program commitments. Records pertaining to the control of procurement documents involving five safety-related contracts for two projects were examined. It was determined that these activities had been conducted in conformance with procedural requirements.

4. Evaluation of Supplier Performance - Applicable procedures/sections from the Procurement Supplier Quality Manual, Engineering Department Procedures Manual, and project procedures for two projects were examined to ascertain that procedures had been prepared and approved that prescribe a system for the evaluation of a suppliers performance that is consistent with QA Program commitments. Supplier Quality Inspection records maintained on five suppliers of safety-related equipment for two projects were examined. It was determined that these activities had been conducted in conformance with procedural requirements.

ORGANIZATION: BECHTEL POWER CORPORATION
SAN FRANCISCO POWER DIVISION
SAN FRANCISCO, CALIFORNIA

REPORT NO.: 99900522/81-03	INSPECTION DATE(S): 10/19-22/81	INSPECTION ON-SITE HOURS: 54

CORRESPONDENCE ADDRESS: Bechtel Power Corporation
San Francisco Power Division
ATTN: Mr. C. D. Statton
Vice President and General Manager
P. O. Box 3965
San Francisco, CA 84119

ORGANIZATION CONTACT: Mr. C. W. Dick, QA Manager
TELEPHONE: (415) 768-0790

PRINCIPAL PRODUCT: Architect Engineering Services

NUCLEAR INDUSTRY ACTIVITY: The total effort committed to domestic nuclear activities is approximately 93% of the 6150 person staff of the San Francisco Power Division. The division currently provides the principal architect engineering services for six domestic units: Limerick 1 and 2; Susquehanna 1 and 2; and Hope Creek 1 and 2; and has 12 units under a modification/repair/service type contract plus an engineering evaluation contract with a NSSS supplier.

ASSIGNED INSPECTOR: J. R. Costello for R. H. Brickley — 11/9/81
R. H. Brickley, Reactor Systems Section (RSS) — Date

OTHER INSPECTOR(S): J. R. Costello, RSS

APPROVED BY: C. J. Hale — 11-10-81
C. J. Hale, Chief, RSS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21, 10 CFR Part 50, Appendix B, and Topical Report No. BQ-TOP-1.

B. SCOPE: Design process management, design corrective action, training, and status of previous inspection findings.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

The effectiveness of EDP-4.65 (Design Deficiency Processing) in implementing Section 9 (Design Corrective Action) of ANSI N45.2.11 could not be demonstrated during this inspection. This area will be examined further during a future inspection.

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Unresolved Item (78-02): It is not clear that the definition of when a document becomes a QA record satisfies the intent of ANSI N45.2.9.

   Appendix A-16 of Revision 3 to BQ-TOP-1 dated October 1980 now defines a QA record as follows: A document is considered completed when it has finished full processing and has been issued for use in design, procurement, construction, or manufacturing. Section 5 of the Hope Creek NQAM has been revised to incorporate this definition.

2. (Closed) Follow-Up Item (80-02): Three errors were identified in Calculation No. 14-13.

   This item was reviewed and closed by the NRC:RIII inspector and documented in the RIII Report No. 50-266/81-09, 50-301/81-10.

3. (Open) Unresolved Item (80-03): The position of relying on IE Bulletin activities to evaluate the significance of a potential safety hazard, instead of evaluating per 10 CFR Part 21, has been submitted to NRC Headquarters for review.

E. OTHER FINDINGS OR COMMENTS:

1. Design Process Management - Section 17 of the Hope Creek and Limerick PSARs and applicable procedures were examined to determine that a system for design process management had been prescribed which is consistent with the commitments of the Bechtel quality assurance program. The following documents were examined to determine that the design process procedures were being implemented: four drawings; 14 specifications; three design review notices; five design control check lists; one design criteria; two signature and initials specimen cards; and one verification of design document review and approval. Relative to the documents examined, all procedural requirements were being implemented.

2. Training - Applicable procedures from the QA Department Manual, Engineering Department Procedures Manual; Procurement Supplier Quality Manaul; M&QS Procedure, Practice, Guide Manual; and the Construction QC Manual were examined to determine that procedures had been prepared and approved consistent with QA program commitments. Training records maintained on personnel from each classification (i.e., new employees, inspection, examination and test, special process, auditor, engineering, and procurement) were examined to determine that the procedures for training activities were being implemented. It was determined that these employees had received training consistent with QA program commitments.

3. Design Corrective Action - Applicable procedures from the Engineering Department Procedures Manual were examined to determine that procedures had been prepared and approved consistent with QA program commitments. The Design Deficiency Review Log covering the period July 1, 1980, to October 21, 1981; Monthly Quality Engineer Reports No. 95 through 108 covering the period July 1, 1980, through September 30, 1981; and related records were examined to determine that the design corrective action procedures were being implemented. One unresolved item was identified (see C. above). This area is in the proce-s of revision as a result of internal audit findings and will be inspected further during subsequent inspections.

ORGANIZATION: Brown Boveri Electric, Incorporated
Switchgear Systems Division
Spring House, Pennsylvania

REPORT NO.: 99900740/81-02	INSPECTION DATE(S): 10/26,27,30/81	INSPECTION ON-SITE HOURS: 10

CORRESPONDENCE ADDRESS: Brown Boveri Electric, Incorporated
Switchgear Systems Division
ATTN: Mr. D. D. Duvall
Vice President and General Manager
Norristown Road and Route 309
Spring House, PA 19477

ORGANIZATION CONTACT: Mr. E. W. Rhoads, Manager-Quality Assurance
TELEPHONE: (215) 628-7660

PRINCIPAL PRODUCT: Switchgear

NUCLEAR INDUSTRY ACTIVITY: This information was not obtained.

ASSIGNED INSPECTOR: I. Barnes
for W. E. Foster, Reactive Inspection Section (RIS) 12-18-81
Date

OTHER INSPECTOR(S):

APPROVED BY: I Barnes
I. Barnes, Chief, RIS 12-18-81
Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21; and 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made as a result of the issuance of a 10 CFR Part 21 Report pertaining to inadequate separation of Class IE and Non-Class IE conductors in the 480 volt load center isolation relay cabinets that have been furnished to the Palo Verde Nuclear Generating Station, Unit Nos. 1, 2, and 3. An additional area of inspection was follow up on an unresolved item.

A. VIOLATION:

Contrary to paragraph 21.51(b) of 10 CFR Part 21, a record of evaluation had not been prepared for the identified Class IE/Non-Class IE conductor separation problem in the 480 volt load center isolation relay cabinets furnished to the Palo Verde Nuclear Generating Station, Unit Nos. 1, 2, and 3.

B. NONCONFORMANCE:

Contrary to the requirements of Quality Assurance Procedure No. 10.7, Revision 2, dated April 18, 1978, 100% inspection of crimped terminal lugs on nuclear switchgear had not been performed, as evidenced by the lack of records to substantiate accomplishment of this activity.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

(Resolved) Unresolved Item (81-01): It was not apparent to the NRC inspector that 100% inspection of crimped terminal lugs, on nuclear switchgear, had been performed.

The inspector verified that there were no records to substantiate that 100% inspection of crimped terminal lugs on nuclear switchgear had been performed. This item has therefore been closed and replaced with the nonconformance identified in paragraph B above.

E. OTHER FINDINGS OR COMMENTS:

1. Follow up on a 10 CFR Part 21 Report - The engineering drawings related to the Isolation Relay Cabinet did not provide quantitative data relative to the separation criteria. Rather, the information is depicted by symbols with statements that wires are to be run in front of or behind barriers. It appears that insufficient data/instructions were a contributing factor to inadequate separation of Class IE/Non-Class IE conductors. The inspector was informed that the hardware was corrected at the site by rerouting the wires; however, no documents were provided to support this statement. Drawings of current projects, with conductor separation requirements, are more specific, inasmuch as the requirement has been quantified.

   A Gould-Brown Boveri letter, dated February 9, 1981, to Bechtel Power Corporation states, in part, "The BBE evaluation of this condition indicates that this type of condition is not reportable to the NRC under the requirements of 10 CFR Part 21." One violation was identified as a result of there being no record of this evaluation.

2. Follow Up on an Unresolved Item - Terminal lugs are crimped onto conductors and connections made to devices or terminal strips. The crimped terminal lugs on nuclear switchgear are required to be 100% inspected; however, the crimped terminal lugs/conductors are not disconnected from the devices or

terminal strips to facilitate inspection of the crimped terminal lugs. Consequently, some required inspection features are not visible for inspection; e.g., (1) wire range stamped on terminal; and (2) nicked or missing conductor strands, especially on conductors connected closest to the device or terminal strip of multi-terminal connections.

ORGANIZATION: CONAX CORPORATION
BUFFALO, NEW YORK

REPORT NO.: 99900323/81-01	INSPECTION DATE(S): 8/10-13/81	INSPECTION ON-SITE HOURS: 25

CORRESPONDENCE ADDRESS: Conax Corporation
ATTN: Mr. R. L. Duroure
QA Manager
2300 Walden Avenue
Buffalo, NY 14225

ORGANIZATION CONTACT: Mr. R. L. Duroure, QA Manager
TELEPHONE: (716) 684-4500

PRINCIPAL PRODUCT: Electrical Penetration Assemblies

NUCLEAR INDUSTRY ACTIVITY: The Conax nuclear product output is 45% of sales. The plant holds valid ASME "N" and "NPT" symbol authorizations.

ASSIGNED INSPECTOR: R. E. Oller, Components Section (CS) — Date: 9-21-81

OTHER INSPECTOR(S):

APPROVED BY: U. Potapovs, Acting Chief, CS — Date: 9-21-81

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B; and 10 CFR Part 21.

B. SCOPE: Status of previous inspection findings; manufacturing process control; change control; nonconformances and corrective action; and 10 CFR Part 21.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Deviation A (78-01): Contrary to Criterion IV of Appendix B to 10 CFR Part 50 and Nuclear QA Procedure No. 4.4, outgoing Purchase Order No. 51392 for safety-related items did not require the supplier to have a quality assurance program consistent with 10 CFR Part 50, Appendix B.

   The NRC inspector verified that Conax has provided the following corrective and preventive actions in accordance with their response letter dated July 7, 1978. A Change Order No. 51392-1 was issued on July 14, 1978, to provide requirements that the applicable portions of Appendix B to 10 CFR Part 50 applied to the above P.O. The Conax Purchase Specification No. IPS-30, Revision G was revised to include the QA program requirements of ANSI N45.2-1971 and 10 CFR Part 50, Appendix B; also, two Conax purchase orders issued in December 1980, were determined to include the requirements of IPS-30, Revision J. Review of records of a meeting, dated June 9, 1978, between QA Management and reviewers of purchase requisitiors confirmed that the reviewers were reindoctrinated concerning a more careful observance of the application of 10 CFR Part 50, Appendix B requirements in procurement of safety-related materials.

2. (Closed) Deviation B (78-01): Contrary to Criterion IV of Appendix B to 10 CFR Part 50 and the Nuclear QA Procedure 4.2, the QA Manager had not initialed and dated the QA copy of four purchase orders to show his approval.

   The NRC inspector verified that Conax provided the following corrective and preventive actions in accordance with their response letter dated July 7, 1978. To clarify the original intent of procedure 4.2, paragraph 4.2.3 was revised on October 30, 1978, to provide that the QA Manager would review and approve by initialing purchase requisitions and purchase orders for Pressure Retaining Materials only. Review of a current P.O. No. N-66592, dated July 14, 1981, and the related purchase requisition for pressure retaining material confirmed that both documents were reviewed and approved by the QA Manager

3. (Closed) Deviation C (78-01): Contrary to Criterion XII of Appendix B to 10 CFR Part 50; Nuclear QA Procedure No. 12.1, and QC Instruction No. 29-2-9, a Ball Micrometer had not been calibrated to the required frequency of six months.

   The NRC inspector verified that Conax provided the following corrective and preventive actions in accordance with their letter dated July 7, 1978. Review by Conax during the previous inspection verified that the Ball Micrometer had been calibrated on schedule but the technician had failed to record the action on the Gage Calibration Card and affix a calibration label to this micrometer. During the previous inspection this micrometer was recalibrated, recorded, and labeled. Review of other calibration records by Conax confirmed that none were deficient. During this NRC inspection review of records of a conference dated June 16, 1978, between the Calibration Technician and the QA Supervisor verified that the importance of accurate recording of calibration activities was reemphasized. Review of the current calibration record for the Ball Micrometer verified that accurate records are being maintained.

4. (Closed) Deviation D (78-01): Contrary to Criterion XV of Appendix B to 10 CFR Part 50 and the Nuclear QA Procedure No. 15.3, Material Disposition Reports were not affixed to four header plate parts in the "Nuclear Storage Area-Nonconforming."

   The NRC inspector verified that Conax provided the following corrective and preventive actions in accordance with their response letter dated July 7, 1978. When Procedure 15.3 was written Conax had not considered that the MDRs could not be readily attached to certain items, so to accomodate the exceptions, the procedure was revised on October 30, 1978, to provide for affixing a Reject Tag, with the MDR number on it, to items to which an MDR could not be attached. During the inspection the NRC inspector observed, in the nonconforming hold area, that a "Feed Through Tube" and a "Header Plate" had attached Reject Tags containing MDR numbers in lieu of attached MDRs.

5. (Closed) Deviation E (78-01): Contrary to Criterion XVIII of Appendix B to 10 CFR Part 50 and the QC Instruction 18.1, records dated January 3, 14, and March 1, 1977 of the Lead Auditor-Auditor qualification had not been updated annually.

   The NRC inspector verified that Conax provided the following corrective and preventive actions in accordance with their response letter dated July 7, 1978. On May 18, 1978, all auditor records were updated and a follow-up system using a "QA Follow-Up Log" was established to assure that auditor reviews were performed on time. Review during this inspection verified that Lead Auditor annual evaluations were performed on January 3, 1978, May 18, 1978, April 15, 1980, and April 10, 1981. The annual auditor evaluations were performed on January 14, 1977, May 17, 1978, May 7, 1979, April 15, 1980, and April 20, 1981. Log entries

indicated that the Lead Auditor and Auditor annual evaluations were due on April 11, 1982.

6. (Closed) Deviation F (78-01): Contrary to Criterion VI of Appendix B to 10 CFR Part 50 and the Nuclear QA Procedure No. 8.4, limited changes on travelers for two different parts, had not been initialed and approved by the QA Engineer.

   The NRC inspector verified that Conax provided the following corrective and preventive actions in accordance with their letter dated July 7, 1978. The two subject travelers, involving limited changes, were re-processed to the QA Engineer who reviewed, approved, and initialed them. The Plant Manager held training sessions on June 6, 1978, and June 20, 1978, for Engineering Production Personnel and Manufacturing Personnel covering the applicable sections of the QA Manual and specifically NQA Procedure 8.4.5 covering the use of the Operation and Inspection Record System (travelers). These meetings were documented in the Plant Manager's memorandum dated July 5, 1978, to the QA Manager.

7. (Closed) Deviation G (78-01): Contrary to Criterion VI of Appendix B to 10 CFR Part 50 and Engineering Instruction Nuclear No. 5.1, a person other than the designated Design Supervisor had signed the "check" space of Engineering Order No. N-0694.

   The NRC inspector verified that Conax provided the following corrective and preventive actions in accordance with their response letter dated July 7, 1978. Conax had decided that since the Design Supervisor initiated the EOs, that in accordance with good engineering practice, he should not check his own work. Therefore, the Job Engineer was assigned the role of checker. To accomodate this change in practice, paragraph 8.2.2.3 of the EIN No. 5.1 was revised on July 7, 1978, to provide that the Design Supervisor or his designee would check drawings and EOs for compliance with requested changes, sign or initial the "check" block, and date the EO. Review of EO No. N-0702 Change A, dated July 13, 1978, verified compliance with the revised EIN.

8. (Closed) Deviation H (78-01): Contrary to Criterion VI of Appendix B to 10 CFR Part 50 and Engineering Instruction No. 5.1.1, appropriate approval signatures had not been entered on Engineering Orders Nos. N-0679 and N-0702 for IPS Documents No. 267 and 333, respectively.

   The NRC inspector verified that Conax had provided the following corrective and preventive actions in accordance with their response letter dated July 7, 1978. Conax reissued EOs No. N-0679 and No. N-0702 on July 13, 1978, and obtained the signatures required by EIN-5.1.1. A meeting was held on July 5, 1978, at which the Chief Engineer, the Document Supervisior, and the Documentation Clerk were reinstructed concerning meeting the requirements of EIN-5.1.1.

9. (Closed) Deviation I (78-01): Contrary to Criterion III of Appendix B to 10 CFR Part 50 and the Nuclear QA Procedure No. 5.1, the "Pressure Boundry" block on the Engineering Change Order (ECO) was being checked automatically when the hardware contained pressure boundry material and not after a review of the Stress Report.

   The NRC inspector verified that Conax provided the following corrective and preventive actions in accordance with their response letter dated July 7, 1978. To provide corrective action effective May 22, 1978, Conax rechecked all ECOs, issued since September 20, 1977, for compliance with the requirements of paragraph 5.1.6 of NQA Procedure No. 5.1 and reissued them after review of the Stress Reports where pressure boundry materials were involved. On July 11, 1978, the Nuclear Chief Engineer issued a directive to the Job Engineers, directing that the Pressure Retaining Material block on the EOs should be checked only after review of the Stress Reports to determine if changes affected the Stress Report. Review, during this inspection of ECN No. N-1564 dated July 31, 1981 (formally ECO), verified that it contained a statement "Does not affect the Design Report" as evidence of review, and it was properly signed.

10. (Closed) Unresolved Item (78-01): Procedures require that the Job Engineers review, approve, and initial purchase requisitions (PR) for materials. It appears that several PRs were initialed by Job Engineers in the "Requested By" space instead of the "Approved By" space. The vendor indicated action would be taken to resolve this matter.

    The NRC inspector verified that the "Approval" blocks on purchase requisitions have been changed to identify the approval position as Engineer/Supervisor. The "Requested By" block is now separate. This latter block is completed by Production Control.

E. OTHER FINDINGS OR COMMENTS:

1. Manufacturing Process Control

   This area of the inspection was accomplished by: review of nine QA Manual-Nuclear QA Procedures; examination of three Operation and Inspection Record travelers in the machine shop for various parts, two Nuclear O&IR travelers for penetrations being assembled, and two Nuclear O&IR travelers for completed and shipped penetrations; examination of the documents in a traveler package prior to release to manufacture; review of the "Material Traceability Log" for five different Penetration Sub-assemblies identified by Serial Numbers; review of three Conax customers Purchase Order Specifications; review of two Conax manufacturing procedures for the Vogtle Units 1 and 2 work, and observations of in-process parts and penetration assemblies. No nonconformances or unresolved items were identifed in this area.

2. Change Control

This area of the inspection was accomplished by: review of seven QA Manual-NQA Procedures; review of a Conax customer purchase order and change order, Conax documentation check list, a Conax drawing, and its revision, and an engineer order, all for the Palo Verde work; review of a Conax purchase requisition and the related purchase order, and changes to these two documents. No nonconformances or unresolved items were identified in this area.

3. Nonconformances and Corrective Action

This area of the inspection was accomplished by: review of five QA Manual-NQA Procedures; observation of the locked room used for segregation of nonconforming material and the items therein; review of 16 current completed Material Deficiency Reports; review of four MDRs involving corrective action requests by the QA Manager to manufacturing departments, and two MDRs involving corrective action requests to subvendors; review of the QA Manager's Corrective Action Follow-up on MDR's system for internal delayed responses to CARs, the QA Manager's Monthly Report on delayed MDR response, and notes of a monthly corrective action meeting between the QA Manager and the Plant Manager covering MDRs and other topics. No nonconformances or unresolved items were identified in this area.

4. 10 CFR Part 21

This area of the inspection was accomplished by: observation of the posted documents required by 10 CFR Part 21 and review of QA Manual-NQA No. 1.5 covering reporting of defects and noncompliances under 10 CFR Part 21. No violations were identified in this area.

ORGANIZATION: CONSOLIDATED CONTROLS CORPORATION
BETHEL, CONNECTICUT

REPORT NO.: 99900221/81-01	INSPECTION DATE(S): 8/25-27/81	INSPECTION ON-SITE HOURS: 24

CORRESPONDENCE ADDRESS: Consolidated Controls Corporation
ATTN: Mr. John Engelberger
Vice President/General Manager
15 Durant Ave.
Bethel, CT 06801

ORGANIZATION CONTACT: Mr. L. E. Goodsell, Jr., QC Manager
TELEPHONE: (203) 743-6721

PRINCIPAL PRODUCT: Electronic Instrumentation and Control Systems

NUCLEAR INDUSTRY ACTIVITY: Consolidated Controls has manufacturing plants in Bethel and Danbury, Connecticut, engaged in the manufacturing of commercial nuclear electronic instrumentation and control systems. The output of both plants is 16% for the commercial nuclear industry.

ASSIGNED INSPECTOR: R. E. Oller — 10-9-81
R. E. Oller, Components Section (CS) — Date

OTHER INSPECTOR(S):

APPROVED BY: U. Potapovs — 10-19-81
U. Potapovs, Acting Chief, CS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50 and 10 CFR Part 21.

B. SCOPE: Status of previous inspection findings; manufacturing process control; change control; nonconformances and corrective action; and 10 CFR Part 21 implementation.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Deviation A (78-01): Failure by the QC Department to review, approve, and enter Q.C.R. and initials on Purchase Order No. 56922-7, dated May 5, 1978, and the related order cards.

   The inspector verified that in accordance with the CCC response letters, dated September 1, 1978, and October 31, 1978, that current purchase orders are reviewed by QC and approved by stamping with Q.C.R. FB., while the order requisition cards are reviewed and approved by stamping Q.C.R., FB., C of C.

2. (Closed) Deviation B (78-01): Failure to identify the document "Authorities and Duties of the Quality Control Staff" as Appendix 1 in the QC Manual No. 2, as committed to in Consolidated Controls Corporation's corrective action response letter, dated December 20, 1977.

   The inspector verified that in accordance with the CCC response letters, dated September 1, 1978, and October 31, 1978, the document "Duties of the Quality Control Staff" was added to the Table of Contents of Revision 4 of QCM No. 2, and was denoted as being available on request.

3. (Closed) Deviation C (78-01): Failure to add Test Procedure KGD 1315 to the manufacturing routing for conducting dielectric and insulation resistance tests on the 9N30 assembly, as committed to in the CCC corrective action response letters, dated August 25, 1977, and September 22, 1977. Also, failure to identify the dielectric and insulation test procedure on the manufacturing routing Revision D, dated May 27, 1977, for Assembly No. 9N28.

   The inspector verified that in accordance with the CCC response letters, dated September 1, 1978, and October 31, 1978, CCC has changed the manufacturing routing sheets for assemblies 9N28 and 9N30 to include the test procedures numbers KGK-1315 and KGD-1315, respectively, for the operations covering the dielectric and insulation test. Also two current routing sheet records had the required test procedure numbers KAF-7315 and KBG-7317 opposite the operation covering the Hi.Pot and I.R. tests.

4. (Closed) Deviation D (78-01): Failure to list by number in the tooling column of the manufacturing routing, dated September 15, 1977, the correct harness board for Assembly No. 9N38-6, as committed to in the CCC response letter, dated September 22, 1977, and to properly identify harness boards.

   The inspector verified that in accordance with the CCC response letters, dated September 1, 1978, and October 31, 1978, the item of concern was incorrectly identified by CCC as a harness board, but was actually a manufacturing aid called an "Easel Wiring Fixture." The identification of this item was corrected for Panal Type 9N38-6, and was correctly listed in the routing tooling column. Also, the incorrectly identified harness boards were properly identified as No. 7N186.

5. (Closed) Deviation E (78-01): Failure to provide evidence of CCC inspection and proper identification of acceptance of 40 relays, Parts Nos. KHF-431A and KHE-431A located in the assembly/test area of Plant No. 2, as committed to in the CCC corrective action response letter, dated September 22, 1977.

   The inspector verified that in accordance with the CCC response letters, dated September 1, 1978, and October 31, 1978, the items of concern had been transferred from Plant No. 1 to Plant No. 2 without the inspection acceptance tag covering the inspection acceptance of Plant No. 1. To prevent this type of oversight, CCC had initiated the use of a multipart inspection tag for release from accepted stores in both plants. The use of this multipart tag was short as CCC was unable to secure further supply of tags and reverted to the use of a one piece tag. The current practice is to ship parts designated for use in Plant No. 2 directly to Plant No. 2, where they are inspected on receipt. For any items transferred from Plant No. 1 to Plant No. 2, a duplicate acceptance tag is made out and attached to the items before transfer.

6. (Closed) Deviation F (78-01): Failure to provide measures to assure that rented measuring and testing equipment used in activities affecting quality were properly controlled, calibrated, and adjusted at specified periods, in accordance with Criterion XII of Appendix B to 10 CFR Part 50.

   The inspector verified that in accordance with the CCC response letters dated September 1, 1978, and October 31, 1978, paragraph 9.6 was added to Revision No. 4 of the QC Manual No. 2, to provide for an inspection copy of the purchase order for rental-lease or loan of test equipment, to be sent to the CCC calibration laboratory personnel, who would provide control and verification of calibration of the equipment when it was sent to the designated department. The manual revision also provided for recall of the equipment, under the CCC calibration system, if it was kept beyond the recalibration due date.

E. OTHER FINDINGS OR COMMENTS:

1. Manufacturing Process Control

The inspector reviewed three sections of the QC Manual QCM No. 2, Revision 6, which were applicable to the assembly, test, and inspection of printed circuit board assemblies and assembly and test of control cabinets.

Observations were made in Plant No. 2 of the in-process work on circuit board module assembling, wave soldering, electronic testing, final inspection, and control cabinet assembling.

Review included one in-process assembly route sheet (traveler) with related documents and records, and one completed assembly route sheet (traveler) document and record package for printed circuit board logic modules Part No. 6N309. The related documents and records reviewed included: three related, but separate, soldering and cleaning procedures and an acceptance standard; parts list; drawings; cabinet module loading list; engineering instructions for functional tests; QC instructions for electronic testing; inspection procedures; inspection and test reports; reject tags; and a customer purchase order quality requirement specification.

Within this area, no nonconformances to NRC, customer order, or the QC program requirements were identified and no unresolved items were identified.

2. Change Control

The inspector reviewed Section II of the QC Manual QCM No. 2, Revision 6, which was applicable to changes in design, procurement, and manufacturing documents.

To verify that changes in design documents were controlled, a review was made of: a revised printed wiring board (P.W.B.) assembly drawing No. 6N306, Revision C, the related engineering change notice (C/N) No. S-2733, and three requests for action (R/A) which were incorporated into the C/N S-2733; the revised parts list Module PL-6N306, Revision E; the related C/N S-3167; and a six page handwritten engineering memorandum list of changes to be incorporated into C/N S-3167.

Also reviewed were an engineering biweekly list of open R/A's, dated August 10, 1981; the notes of the meeting of the Design Review Committee, dated August 27, 1981; and a Data List, Revision K, dated May 2, 1981, of all required documents for cabinets 9N48 and 9N49.

To verify that changes in procurement were controlled, the inspector reviewed a current purchase order involving Change Notice No. 1.

Within this area, no nonconformances to NRC, customer order, or QC Program requirements were identified, and no unresolved items were identified.

3. Nonconformances and Corrective Action

The inspector reviewed four sections of the QC Manual QCM No. 2, Revision 6, which were applicable to the control and disposition of deficiencies in procured items and in-process items and those deficient items requiring corrective action requests.

To verify that nonconforming items were reviewed and accepted, rejected, repaired, or reworked, and that conditions adverse to quality, including the cause, are promptly identified and corrected, a review was made of: six current Discrepancy Reports; a current monthly Summary of Discrepancy Reports with Material Review Board Action; a current monthly Summary of Discrepancy Reports for Internal Departments; three current Corrective Action Request for Procured Materials, and two current Quality Audit/ Corrective Action Requests for Internal Department Discrepancies.

Within this area, no nonconformances to NRC, customer order, or QC program requirements were identified, and no unresolved items were identified.

4. 10 CFR Part 21

The inspector reviewed the Standard Instruction No. 1563.031, dated January 6, 1978, "Reporting of Defects and Non-Compliances," to verify that documented measures were available to meet the reporting requirements of 10 CFR Part 21.

Observations were made, in the final inspection area, of the posted copies of 10 CFR Part 21, Article 206 of the Energy Reorganization Act of 1974, and the above CCC Procedure No. 1563.031.

Within this area, no violations were identified.

ORGANIZATION: CORPORATE CONSULTING & DEVELOPMENT COMPANY, LTD.
RALEIGH, NORTH CAROLINA

REPORT NO.: 99900511/81-01	INSPECTION DATE(S): 8/31-9/3/81	INSPECTION ON-SITE HOURS: 32

CORRESPONDENCE ADDRESS: Corporate Consulting & Development Company, Ltd.
ATTN: Dr. J. R. Yow, President
Post Office Box 30096
Raleigh, NC 27612

ORGANIZATION CONTACT: Mr. T. L. Atkinson, QA Manager
TELEPHONE: (919) 782-3441

PRINCIPAL PRODUCT: Engineering Consultant Services

NUCLEAR INDUSTRY ACTIVITY: Corporate Consulting & Development Company, Ltd. provides engineering consultant services to the nuclear industry for seismic analysis, testing, and nuclear environmental qualification of equipment. Eighty-two percent of their personnel (28) are assigned to activities for domestic nuclear projects.

ASSIGNED INSPECTOR: R. H. Brickley 10/6/81
R. H. Brickley, Reactor Systems Section (RSS) Date

OTHER INSPECTOR(S):

APPROVED BY: C. J. Hale 10-7-81
C. J. Hale, Chief, RSS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21 and 10 CFR Part 50, Appendix B.

B. SCOPE: Seismic analysis of transformer wall mounts, 10 CFR Part 21, and review of QA program and procedures.

A. VIOLATIONS:

Contrary to 10 CFR Part 21, paragraphs 21.6, 21.21, and 21.31, Corporate Consulting & Development Company, Ltd. has failed to implement the requirements of this part in that copies of the required documents have not been posted, appropriate procedures have not been adopted, and procurement documents do not specify that the provisions of 10 CFR Part 21 apply.

This is a Severity Level IV Violation.

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS::

1. Seismic Analysis of Transformer Wall Mounts - This item is a follow up to a 10 CFR Part 50.55(e) report by TVA that questioned the validity of the seismic analysis of transformer wall mounts performed by Corporate Consulting & Development Company, Ltd. (CCL). The examination of CCL records maintained on this activity revealed that it was conducted under the requirements of Revision 0 of the CCL Quality Assurance Manual dated January 1, 1978. CCL maintains that their analysis is valid and that the difference between their results and TVA's is in the methods used. Errors in the TVA analysis, found by the inspector, appear to substantiate CCL's position. Since a decision had been made that the transformers would not be wall mounted, a complete reanalysis was not performed.

2. 10 CFR Part 21 - CCL's QA Manual, Operating Procedures, bulletin board, and nine purchase orders were examined to determine compliance with the requirements of 10 CFR Part 21. It was determined that CCL did not comply with these requirements. (See A above)

3. Review of QA Program and Procedures - CCL's QA Manual and 16 (43%) Operating Procedures were examined to determine that a QA Program and its implementing procedures were in place to meet contractural requirements. Two of the three safety-related contracts examined had imposed the requirements of ANSI N45.2 while the other had imposed the requirements of the purchaser's QA program. It was determined

that procedures are now in place to implement the requirements of ANSI N45.2; however, CCL lacked sufficient detail and specificity to implement the daughter standards; e.g., N45.2.11 and N45.2.9. The majority of the operating procedures had been issued one month prior to this inspection. Implementation of these procedures will be inspected during a future inspection.

ORGANIZATION: EDS NUCLEAR, INCORPORATED
SAN FRANCISCO, CALIFORNIA

REPORT NO.: 99900528/81-01	INSPECTION DATE(S): 7/8-9/81	INSPECTION ON-SITE HOURS: 32

CORRESPONDENCE ADDRESS: EDS Nuclear, Incorporated
ATTN: Mr. L. W. Cooley
Vice President
220 Montgomery Street
San Francisco, CA 94104

ORGANIZATION CONTACT: Mr. B. F. Phipps, QA Manager
TELEPHONE: (415) 544-8050

PRINCIPAL PRODUCT: Engineering Consultant Services

NUCLEAR INDUSTRY ACTIVITY: EDS Nuclear Inc., has 55 contracts involving approximately 49 domestic reactor units for consulting services such as engineering analysis, equipment qualification, licensing assistance, pipe support design, pipe whip analysis and protection design, piping analysis, seismic analysis, and safety analysis.

ASSIGNED INSPECTOR: R. H. Brickley
R. H. Brickley, Reactor Systems Section (RSS) — Date: 10/7/81

OTHER INSPECTOR(S): I. T. Yin, RIII;
D. H. Danielson, RIII (Observer); J. R. Fair, HQS

APPROVED BY: C. J. Hale
C. J. Hale, Chief, RSS — Date: 10-7-81

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21 and 10 CFR Part 50, Appendix B.

B. SCOPE: Analytical errors made by EDS concerning steel containment penetration assemblies for Sequoyah and Watts Bar, 10 CFR Part 21 report of piping analysis errors for Sequoyah, IE Bulletin 79-14 activities, and status of previous inspection findings.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

Contrary to Criterion V of 10 CFR Part 50, Appendix B, Project Instructions contained conflicting design acceptance criteria, did not reflect the latest NRC accepted operability stress limits, and did not provide guidance on use of the Blume Curves. Further, the operability criteria for the evaluation of hangers was not apparent.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Follow-up Item (80-01): The examination of calculation package No. Q1-HPCI-01 revealed that the formal system operability evaluation did not appear to be adequately documented.

   The subject of operability evaluations including calculation No. Q1-HPCI-01 was reviewed. The piping stress analysis shows that the system is within the operability stress limit for the SSE.

2. (Closed) Follow-up Item (80-01): The examination of calculation package No. D2-LPCI-03C revealed that the present method of using the center of gravity of the pipe system to select the horizontal static coefficient used in the calculation appears questionable.

   It was stated by the licensee that the center of gravity method was the original method used by Sargent & Lundy. This item is, therefore, not considered to be within the scope of IEB 79-14.

3. (Closed) Follow-up Item (80-01): It appears that stress intensification factors had not been considered in those system evaluations based on Blume Curve design. EDS Nuclear had assumed that these factors had been considered in these curves. The actual bases of the curves were not available for examination.

   The licensee has committed to use only the rigid span criteria of the Blume Curve, therefore, this item is closed.

4. (Closed) Follow-up Item (80-01): In reviewing the requirements for using the Blume Curves it appeared that on piping above elevation 579 feet restraint loads will be multiplied by a factor of three to account for amplification.

   Based on the commitment to use rigid span criteria (D.3. above) RIII will resolve this matter with the licensee.

E. OTHER FINDINGS OR COMMENTS

1. Analytical Error Concerning Steel Containment Penetration Forces - This item was reported to RII per 10 CFR Part 50.55(e) by TVA concerning the omission of axial forces on piping penetrating containment during pipe stress analysis of Sequoyah 1 and 2 and Watts Bar 1 and 2.

   From the records examined at EDS Nuclear (EDS) it was determined that this analysis was not included in their scope of work for these plants. This item had been brought to TVA's attention by EDS as a result of EDS's investigation of this problem on an analysis performed by them for Duke's McGuire 1 and 2. EDS had recommended that TVA investigate to see if this omission had occurred on analyses performed by other organizations for TVA. With respect to the omission on the McGuire 1 and 2 analysis, the Safety Review Committee concluded that: (1) it had occurred only on McGuire 1 and 2, and (2) that analysis of these forces was not included in their scope of work and they were not directed to include them.

2. Piping Analysis Error - This item, reported to RII per 10 CFR Part 50.55(e) by TVA, concerned the omission of an installed lateral support from the thermal load case analysis performed by EDS on Sequoyah 2.

   From the records examined at EDS it was revealed that the mathematical model that was used was revised on June 17, 1977, as a result of the relocation of valves TVA-51 and FCV-1-182. The corresponding support summaries were updated with respect to loads, however, the displacements were not updated as they should have been, and thus the lateral support was not deleted from the design. The support summaries were processed in accordance with procedures that were in existence at the time of these activities. Subsequent to this, EDS developed and issued Technical Procedure 2.1.12 (Piping Analysis Checking Procedure) which imposes detailed specific items to check on the analysis and all associated documents that should prevent recurrence of these type errors.

3. IE Bulletin 79-14 - Fourteen technical Project Instructions related to IEB 79-14 activities were examined. It was concluded that the instructions contained conflicting requirements and therefore not in conformance with NRC requirements (see B. above).

ORGANIZATION: GENERAL ATOMIC COMPANY, FUEL OPERATIONS DIVISION
SAN DIEGO, CALIFORNIA

REPORT NO.: 99900004/81-01	INSPECTION DATE(S): 8/24-28/81	INSPECTION ON-SITE HOURS: 30

CORRESPONDENCE ADDRESS: General Atomic Company
Fuel Operations Division
ATTN: Mr. D. R. Van Hilton
Executive Vice President
Post Office Box 81608
San Diego, CA 92138

ORGANIZATION CONTACT: Mr. T. R. Colandrea, Director, QA Division
TELEPHONE: (714) 455-4570

PRINCIPAL PRODUCT: Nuclear Fuel Assmeblies

NUCLEAR INDUSTRY ACTIVITY: Nuclear fuel supplier for GA designed cores.

ASSIGNED INSPECTOR: W. M. McNeill — 9/16/81
W. M. McNeill, Components Section (CS) — Date

OTHER INSPECTOR(S):

APPROVED BY: U. Potapovs — 9/16/81
U. Potapovs, Acting Chief, CS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: Document control; fuel particle manufacturing; audits; and control of nonconformances and corrective action.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to the Procedure FPD-203, Section 5.5.11(b) and Criterion V of Appendix B to 10 CFR Part 50, one mix lot of four inspected was found below procedure and specification limits and had not been placed on hold and resampled. An erroneous carbon result had been recorded on the run sheet.

2. Contrary to the Quality Assurance Manual, Section 18, paragraph 4.2 and Criterion V of Appendix B to 10 CFR Part 50, one special process, BAF measurements, was not audited in 1980 and 1981.

3. Contrary to the Procedure QDI-18-2, Section 4.2.6 and Criterion V of Appendix B to 10 CFR Part 50, the records of the two lead auditors sampled had no evidence of a passing score on the GA Lead Auditor Examination or performance of a practical examination.

4. Contrary to the Procedure QDI-23-11, Section 5.1.2 and Criterion V of Appendix B to 10 CFR Part 50, two of three bottles of nonconforming recycle mix material were found to be not tagged. The third bottle was tagged with a Notice of Discrepancy (NOD) tag with an erroneous Nonconformance Report (NR) number.

C. UNRESOLVED ITEMS:

1. Document Control - Fourteen manufacturing and inspection procedures and one design specification, GA 10600 were inspcted. The current issues of procedures were found at work stations. Proper review were and approval was verified. Changes were made in accordance with the established procedure.

2. Fuel particle manufacturing - The manufacturing activity during this inspection was on fertile particle mixing, sizing, spheroidizing, and screening. The mixing operation was reviewed in detail for conformance to the procedure and specification requirements. The use of released starter material and the proper identification of material were verified. In this area nonconformance number 1 was found.

3. Audits - Annual audits of fuel operations for 1981, 1980, and 1979 were inspected. The qualification records of four auditors were reviewed. The documentation of audit results and findings was verified. The audit schedule was found to be current. The use of check lists, independent auditors and compliance to the procedure were verified. In this area nonconformances Nos. 2 and 3 were found.

4. Nonconformances and corrective action - Six recent nonconformances were reviewed in detail. Three of these had been reviewed and dispositioned in accordance with the procedure. The Material Review Board activity was inspected for each of these Nonconformance Reports (NR). The NR summary and analysis for segment nine fuel were inspected. In this area nonconformance number 4 was found.

ORGANIZATION: GENERAL ELECTRIC COMPANY
NUCLEAR ENERGY BUSINESS OPERATIONS
SAN JOSE, CALIFORNIA

REPORT NO.: 99900403/81-03	INSPECTION DATE(S): 9/28-10/2/81	INSPECTION ON-SITE HOURS: 87

CORRESPONDENCE ADDRESS: General Electric Company
Nuclear Energy Business Operations
ATTN: Mr. W. H. Bruggeman
Vice President and General Manager
175 Curtner Avenue
San Jose, CA 95125

ORGANIZATION CONTACT: Mr. A. Breed, Manager, Quality Assurance
TELEPHONE: (408) 925-2726

PRINCIPAL PRODUCT: Nuclear Steam System Supplier

NUCLEAR INDUSTRY ACTIVITY: General Electric Company, Nuclear Energy Business Operations (NEBO), has a work force of approximately 7650 people with approximately 98% of that work force devoted to domestic nuclear activity. NEBO currently has 28 reactor units under construction and six reactor units under contract.

ASSIGNED INSPECTOR: D. D. Chamberlain — 11-9-81
D. D. Chamberlain, Reactor Systems Section (RSS) — Date

OTHER INSPECTOR(S): D. F. Fox, RSS
W. E. Foster, Reactive Inspection Section

APPROVED BY: C. J. Hale — 11-9-81
C. J. Hale, Chief, RSS — Date

INSPECTION BASES AND SCOPE:

A. BASES: General Electric Topical Report No. NEDO-11209-04A and 10 CFR Part 50, Appendix B.

B. SCOPE: Procurement Document Control, Quality Assurance Records, Design Corrective Action, Status of Previous Inspection Findings, and follow up on the following requests:

1. Loss of low level scram function due to Reactor Instrument Penetration valve closure upon instrument air loss (Brunswick 1 and 2).

2. Identification of the following problems associated with the Power Generation Control Complex (PGCC): (a) loose contact blocks on CR 2940 tandem block control switches; (b) inadequate separation of electrical conduit; (c) malfunction and internal contact arrangement of Series 20, Type PR-20 Electro

2. SCOPE (Cont.)

switch; and (d) incompatibility between design documents and delivered PGCC panels. Item (a) affects numerous nuclear power plants while item (c) has that potential. Item (b) affected Susquehana, Unit Nos. 1 and 2, while item (d) was limited to Grand Gulf, Unit No. 1.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

Contrary to the requirements of section 5 of Topical Report NEDO-11209, Material Requests for safety related components are not being accomplished and controlled by established procedures and standing instructions.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

(Closed) Nonconformance (81-01): Identification numbers of deviation disposition requests (DDRs) were changed without exhibiting the required dated initials of the QC Engineer and were voided without noting the replacement DDR number.

The only outstanding action remaining on this item after the 81-01 inspection was the General Electric commitment to change Quality Control Standing Instruction (QCSI) 7.2.19. by July 31, 1981, to clarify the numbering practice for DDRs. Revision 8 to QCSI 7.2.19. was issued on July 22, 1981. This revision clarified the numbering practice for DDRs. The committed action has been completed and verified.

E. OTHER FINDINGS OR COMMENTS:

1. Procurement Document Control - The GE Topical Report and applicable implementing procedures were examined to determine the commitments and requirements for the control of procurement documents. Six purchase orders, 31 material requests, nine design and purchase specifications, one drawing, 12 quality review transmittal sheets, 20 internal and external memoranda and other documentation of current procurement activities relative to main steam safety relief valves, low pressure core spray pump motors, and the high pressure core spray diesel generator were examined to verify implementation.

   Within the scope of the inspection, the committed program was being implemented except for the specific nonconformance identified in B. above.

2. QA Records - The GE Topical Report and applicable implementing procedures were examined to determine the commitments and requirements for the generation, storage, and control of quality assurance records. The original copies, the microforms, and selected prints from the microforms of 15 procedures, six purchase orders, 34 material requests, nine design and purchase specifications, three drawings, three audit reports, three letters, and other quality assurance records relative to main steam safety relief valves, the high pressure core spray diesel generator, and flow control valves were examined to verify implementation.

   Within the scope of this inspection, the committed program was being implemented.

3. Design Corrective Action - The GE Topical Report and applicable procedures were examined to determine program commitments and requirements. Nine field deviation disposition requests, four field disposition instructions, one engineering change authorization, four revised specifications, five engineering change notices, two revised drawings, and six engineering audit files were examined to verify implementation of program commitments.

   Within the scope of this inspection, the committed program was being implemented.

4. Follow Up on Requests -

   a. The Brunswick 1 and 2 licensee (Carolina Power & Light Company) reported that if certain combinations of Reactor Instrument Penetration (RIP) valves close due to loss of instrument air pressure or other causes, the reactor low level scram function could be defeated. Apparently, the RIP valves are air operated valves in the instrument sensing lines that fail closed upon loss of air. The purpose of this inspection at GE was to determine GE actions and/or responsibilities relative to this reported condition. After review of GE design documents and discussions with GE personnel, the following conclusions were reached:

      (1) GE design showed excess flow check valves and manual block valves for the instrument sensing lines to be provided by others.

      (2) There was no evidence found to indicate that GE was requested or required to approve the use of air operated valves in the level instrument sensing lines.

      (3) GE is not evaluating the condition at Brunswick but they are presently evaluating a similar generic condition relative to instrument line breaks or failures.

      (4) Apparently, the licensee/Architect Engineer developed the design of the instrument sensing line isolation using the RIP valves.

This item is considered closed with respect to GE, but an inspection of this item will be made at the Architect Engineer.

b. A 10 CFR Part 21 Report, dated May 28, 1981, filed by the Nuclear Power Systems Division (NPSD) of the General Electric Company (GE Co.) attributed loose contact blocks on the CR 2940 tandem block switches to the effects of shipping. However, the Nuclear Control and Instrumentation Department of GE Co. evaluated the effects of shipping by transporting properly assembled panels across country, checking security of fasteners of various components, returning the hardware to San Jose and re-checking fastener security. A Control and Instrumentation memorandum dated November 29, 1979, states in part, "The conclusion of the evaluation is that transportation does not have a significant impact on hardware once it is properly tightened."

Instructions had been provided to owners of Boiling Water Reactors. A procedure had been initiated to specify torque requirements and travelers have been revised to include the procedure.

As a result of the foregoing, it is concluded that adequate corrective actions and preventive measures have been taken.

c. A 10 CFR Part 21 report filed by NPSC-GE Co. did not identify the cause of failure to translate electrical conduit separation requirements into manufacturing documents. During this inspection, the inspector was unable to determine the cause.

Field Deviation Disposition Requests were initiated to correct the problem. Documentation indicates that the problem was restricted to the Susquehana Nuclear Power Plant.

It appears that this was a one-time occurrence which required no preventive measures.

d. An internal contact arrangement problem was identified on a Series 20, Type PR-20 Electro Switch. As a result of continued problems and questions on this device, a meeting was held on September 18, 1981, with the conclusion that Potentially Reportable Condition (PRC) File No. 80-46 (Electroswitch) be re-opened. An NPSD-GE Co. memorandum dated September 30, 1981, attests to re-opening of PRC File No. 80-46.

This item will be evaluated during a future inspection.

e. It was reported that discrepancies existed in the design documentation for the Power Generation Control Complex panels and its associated delivered hardware. Documentation identifies the hardware as termination cabinets. The inspector was informed that: (1) the cause had not been determined; (2) the contract did not require "as shipped drawings;" and (3) hardware shipped prior to that for Grand Gulf, Unit No. 1 had not been evaluated for the problem.

Corrective action had been taken and appeared adequate. Included in the preventive measures was the incorporation of check lists in the Design Record File; however, these check lists or reasonable information were not provided to the inspector during the course of this inspection.

The inspector was informed that the termination cabinets are shipped about one year in advance of other PGCC hardware. This is done to facilitate cable installation at the site. As changes are made in the PGCC during manufacture and test, Field Disposition Instructions (FDIs) are initiated to update the hardware and/or drawings. During a conference call on October 6, 1981, with Messrs. W. R. Marklein and N. E. Barclay, Mr. Marklein provided that information again. He also stated that the activity of furnishing as built drawings was accelerated which precluded initiating incorporating FDIs.

During a future inspection, the following items will be evaluated: (1) cause of the deficiency, (2) contractual requirements for "as shipped drawings;" (3) generic assessment; and (4) incorporation of check lists in the Design Records File.

ORGANIZATION: GIBBS AND HILL, INC.
NEW YORK, NEW YORK

REPORT NO.: 99900524/81-03	**INSPECTION DATE(S):** 8/4-7/81	**INSPECTION ON-SITE HOURS:** 60

CORRESPONDENCE ADDRESS: Gibbs and Hill, Inc.
ATTN: Mr. R. P. DeRienzo, Vice President
Quality Assurance
393 Seventh Avenue
New York, NY 10001

ORGANIZATION CONTACT: Mr. N. N. Keddis, QA Manager
TELEPHONE: (212) 760-5450

PRINCIPAL PRODUCT: Architect Engineering and Consulting Services.

NUCLEAR INDUSTRY ACTIVITY: The total effort committed to domestic nuclear design activities is approximately 25% of the 1,900 employees of Gibbs and Hill, Inc. at their New York facilities. Major design projects include Comanche Peak, Units 1 and 2, Three Mile Island, Unit 1 FSAR update, Beaver Valley, Unit 1 equipment update, and Bellefonte, Unit 1 design studies.

ASSIGNED INSPECTOR: C. J. Hale /for — 9-17-81
D. F. Fox, Reactor Systems Section (RSS) — Date

OTHER INSPECTOR(S): D. D. Chamberlain, RSS

APPROVED BY: C. J. Hale — 9-17-81
C. J. Hale, Chief, RSS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B; Topical Report GIBSAR-17-A; and the PSAR and FSAR for the Comanche Peak Steam Electric Station (CPSES), Units 1 and 2.

B. SCOPE: Design interfaces, design change control, and status of previous inspection findings.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

Contrary to Criterion V of Appendix B to 10 CFR Part 50 and to the requirements of Gibbs and Hill (G&H) Procedure PC-5, vendor drawings depicting valves with 300 PSI rated flanges, to be supplied by Westinghouse in accordance with their Equipment Specification for use in certain 600 PSIG rated safety-related portions of the safety injection and residual heat removal systems of the CPSES, were approved by G&H even though the valves did not satisfy the G&H in-house design requirement for 600 PSIG rated flanges to be used in these systems.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Unresolved Item (80-02): The following two safety concerns did not appear to be timely evaluated and reported in accordance with the intent of 10 CFR Part 21.

   a. HEPA filters and demisters did not appear to be seismically qualified prior to their installation at the Fort Calhoun and at the CPSES nuclear power stations.

      The NRC inspector determined that the G&H procurement specifications for these items for both Fort Calhoun and CPSES required that the ". . . supplier warrant their design to be such that seismically induced stresses would not impair their ability to operate at maximum capacity when required. . . ."

      Review of supplier correspondence indicated that it was not industry practice, at the time these items were delivered to either site, to seismically test the units with their internal components installed. Thus, seismic qualification of the delivered units could not be established by G&H.

      Subsequent seismic qualification testing of representative completed units to the CPSES seismic spectra was conducted under G&H's direction in late 1980 and early 1981. No degradation of the physical appearance nor in the performance characteristics was reportedly observed. A G&H analysis of similar units installed at Fort Calhoun concludes that they ". . . are inherently capable of successfully withstanding any seismic loading to which they could possibly be subjected. . . ."

The Texas Utilities Generating Company and the Omaha Public Power District were advised by G&H of the CPSES and Fort Calhoun results.

b. The post-LOCA airborne radiation protection afforded control room operators at the Fort Calhoun and the CPSES nuclear power stations did not appear to be adequate.

The inspector verified that G&H processed this safety concern in a responsible manner and timely advised the Texas Utilities Generating Company and the Omaha Public Power District that a G&H engineer expressed concern that control room operators may be exposed to excessive radiation levels under certain postulated post-LOCA conditions. Responses from both indicated that they did not consider the G&H engineer's concern to constitute a substantial safety hazard to either the control room operators or to the public. Further action, if any, on this item will be taken directly with the licensees by NRC Headquarters.

2. (Closed) Nonconformance (81-01): Management evaluation of the Engineering Department and the QA program was not performed as scheduled.

Gibbs and Hill reviewed their in-place program for implementing the 10 CFR Part 50, Appendix B requirement for periodic management review of the status and adequacy of the in-place quality assurance program and concluded that certain procedural and methodology changes were desirable. Procedure QAI-G (Procedure For Performance of Audits) was revised to change the requirement for Vice Presidents, or Assistant Vice Presidents to institute an annual review (audit) of the areas under their cognizance to require them to conduct an in-depth evaluation of all internal audit findings against their organizations that were reported by G&H QA since the last annual management review.

3. (Closed) Nonconformance (81-02): Failure to submit to NRC changes in the QA program and organization described in the G&H Topical Report GIBSAR-17-A.

Amendment 5 to GIBSAR-17-A was evaluated by NRC and deemed acceptable on July 8, 1981. G&H management stated that status reports will be issued periodically to NRC to identify changes in the QA program and organization described in the Topical Report.

4. (Closed) Follow Up Item (81-02): The effectiveness of the intradisciplinary and interdisciplinary review of both G&H and vendor design documents will be evaluated.

This item was elevated to a nonconformance. See B. above.

5. (Closed) Follow Up Item (81-02): The basis for, and tracking of, design changes from PSAR commitments will be evaluated.

   G&H Procedure DC-12 (Safety Analysis Reports - Preparation and Review Procedure) describes the basis for, and methodology of, initiating, reviewing, approving, and documenting SAR changes. Implementation of this procedure will be verified during future design inspections.

E. OTHER FINDINGS OR COMMENTS:

1. Design Interfaces - The related sections of the CPSES Project Procedure Manual, PSAR, and FSAR were examined to determine the commitments and requirements relative to control of internal and external design interfaces. Five system descriptions, four specifications, fifteen drawings, three letters, twelve records of interdisciplinary reviews, nine component modification cards relating to the residual heat removal system, the safety injection system, and the chemical and volume control system were examined to verify effective implementation of commitments.

   With respect to the Nonconformance identified in Section B of this report, Crosby drawing DS-C-56885-B, Fisher Drawing F-42310-E, and other valve drawings supplied by Westinghouse, depict valves rated at 300 PSIG with 300 PSIG rated flanges that were designated by Westinghouse for use in certain safety-related systems whose pressure and temperature design conditions were stated as 600 PSIG and 400^{O}F in Westinghouse System Description SD-TBX/TCX-284 and in the CPSES FSAR.

   Six hundred PSIG rated piping flanges cannot physically mate with 300 PSIG rated valve flanges, thus the 600 PSIG rated piping flanges are reportedly being removed from piping installed at CPSES and are being replaced with Type F316 300 PSIG rated flanges and the pipe fabrication isometric drawings revised accordingly. Westinghouse Equipment Specification G-678854 (Revision 1) states in part, that ". . . A 300 # RF Flange of Grade F316 may be substituted for the 600 # RF Flange of Grade F304 . . . when the system requirements fall within the ANSI 300 # F316 temperature and pressure conditions (600 PSIG and 400^{O}F design conditions) . . . ." G&H piping Specification 2323-MS-43A does not permit this substitution.

   Except as described herein, the committed program for control of design interfaces was being implemented.

2. Design Change Control - The related sections of the CPSES FSAR and applicable project procedures were examined to determine commitments and requirements. The following documents were examined to verify that commitments were implemented: Component Modification Card Affected Document Report, Design Engineering Change Deviation Request List, Design Change Authorization Master Index, 20 Design Change Authorizations (DCA), 10 design drawings, 6 Design Engineering/Change Deviation (DE/CD) Requests, 5 Component Modification Cards (CMC), and 2 QA audit reports.

Except as noted herein, the committed program for design change control was implemented. Certain anomalies were noted in the Design Change Authorization Master Index (computer index) and the corresponding DCAs and DE/CDs. The computer index for DCAs was initiated in late 1980 in order to accurately track design changes. The back fit of the index for DCAs that were controlled originally by the G&H Dallas Office was done from an index received from the Dallas Office. It appears that the information transferred from the Dallas Office index was inaccurate in certain areas. G&H must now go directly to the DCA documents and input the correct data into the computer index. G&H management stated that the back fit of the correct data is a major effort and that they would have a documented plan available for NRC review by September 15, 1981. This plan will address projected dates for the back fit of the correct data into the computer indexes and assure that all design change documents are readily available in the project file. Examination of recently issued documents indicated that they were properly listed in the computer indexes and were readily available in the project files. Progress made in the computer index updates and in the ready retrievability of design change documents will be followed during future inspections.

ORGANIZATION: HAYWARD TYLER PUMP COMPANY, DIVISION OF STONE PLATT
BURLINGTON, VERMONT

REPORT NO.: 99900345/81-01	INSPECTION DATE(S): 9/1-3/81	INSPECTION ON-SITE HOURS: 24

CORRESPONDENCE ADDRESS: Hayward Tyler Pump Company
Division of Stone Platt
ATTN: Mr. D. W. Chalmers
General Manager
Post Office Box 492
Burlington, VT 05401

ORGANIZATION CONTACT: Mr. R. C. Groeschel, QA Manager
TELEPHONE: (802) 863-2351

PRINCIPAL PRODUCT: Centrifugal Circulating Water Pumps for Industrial and Utility Applications including ASME Class 2 and 3 Nuclear Pumps.

NUCLEAR INDUSTRY ACTIVITY: Eight contracts representing approximately 20% of the total work load.

ASSIGNED INSPECTOR: Ross L. Brown — 10/1/81
Ross L. Brown, Component Section (CS) — Date

OTHER INSPECTOR(S):

APPROVED BY: U. Potapovs — 10/1/81
U. Potapovs, Acting Chief, CS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B; 10 CFR Part 21; and other applicable regulations.

B. SCOPE: Management meeting and implementation of 10 CFR Part 50, Appendix B, including change control; audits; material identification and control; equipment calibration; and 10 CFR Part 21 inspection.

ORGANIZATION: HAYWARD TYLER PUMP COMPANY, DIVISION OF STONE PLATT
BURLINGTON, VERMONT

REPORT NO.: 99900345/81-01	INSPECTION RESULTS:	PAGE 2 of 2

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Change Control: Review of three engineering change requests, four engineering change notices, two drawings, two bills of material and four purchase order review sheets for contract no. 8222 verified conformance with the specified requirements of QAM Sections 5.0, 6.0, and 7.0 and Engineering Standards Sections 2.0.6/2-1, 3.0.3/1-1, and 8.0.6/1-1.

2. Internal Audits - The 1981 audit schedule, qualification record for three auditors, audit check list for five manual sections, 12 audit reports (scheduled and unscheduled), and six management audit reports verified the audits were conducted by qualified personnel in accordance with the QA Manual and engineering standards.

3. Material Identification and Control - Review of the receiving log, receiving inspection reports, route sheets, and as-built tabulation report for one pump assembly (Contract 8222) verified conformance with the program requirements.

4. Equipment Calibration: The gauge control records for four verniers, three micrometers, one master pressure gauge, three test pressure gauges; usuage log for thread gauges; color code chart; two dimensional inspection reports; and visual examination of the applicable inspection tools verified conformance with program requirements relative to identification, recalibration, condition of tools, and use of color code.

5. 10 CFR Part 21 Inspection: The current copy of the Engineering Standard 8.3.0/1-0 is in compliance with the regulation. The review of the posting of the regulation and standard verified conformance with the requirements.

ORGANIZATION: INRYCO, INC., CONCRETE SYSTEMS DIVISION
BEDFORD PARK, ILLINOIS

REPORT NO.: 99900731/81-01	INSPECTION DATE(S): 7/13-17/81	INSPECTION ON-SITE HOURS: 64

CORRESPONDENCE ADDRESS: Inryco, Inc.
ATTN: Mr. D. W. Waitkus
Supervisor, Quality Assurance
7200 S. Narragansett Avenue
Bedford Park
Chicago, Illinois 60638

ORGANIZATION CONTACT: Mr. D. W. Waitkus, Supervisor, Quality Assurance
TELEPHONE: (312) 594-7300

PRINCIPAL PRODUCT: Post tensioning systems for reactor containments.

NUCLEAR INDUSTRY ACTIVITY: Inryco currently has active contracts for: (1) supply and installation of 170-wire tendons at Bellefonte Units 1 and 2, Callaway Units 1 and 2, Wolf Creek Unit 1 and Marble Hill Units 1 and 2; (2) supply and installation of 90-wire tendons at Bailly Unit 1; and (3) supply of 170-wire tendons to Byron Units 1 and 2, and Braidwood Units 1 and 2.

ASSIGNED INSPECTOR: L. E. Ellershaw, Reactive Inspection Section (RIS) — Date: 10-2-81

OTHER INSPECTOR(S): I. Barnes, Chief, RIS

APPROVED BY: I. Barnes, Chief, RIS — Date: 10-2-81

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21 and 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made as a result of: (1) the identification of questionable material heat traceability for certain anchorheads and the failure to provide certified material test reports for several heats of anchorhead material, that have been furnished to Bellefonte, Units 1 and 2; and (2) the identification at Braidwood, Unit 1, and Bellefonte, Units 1 and 2, of dimensionally nonconforming anchorage material. Additional areas included in the inspection were status of previous inspection findings.

A. VIOLATIONS:

Contrary to paragraph 21.6 of 10 CFR Part 21, the required posting of Section 206 of the Energy Reorganization Act of 1974 and adopted procedures, or alternate notice, had not been accomplished in the Inryco manufacturing facility.

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 4 in Title VII of the QA Manual, Purchase Order 41P00491 was submitted to Unigage Instruments Corporation for the acquisition and calibration of micrometers, without requesting or receiving approval of the source from the Quality Assurance Section.

2. Contrary to the Inryco corrective action response letter of June 26, 1981, a nonconformance report was not issued and distributed within 30 days of identification of nonconformances of bushing measurements with the requirements of Quality Control Procedure No. 5.2.6-781, Revision 3.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraph 2.13.1 of Procedure QC 5.1 and procedure QCP 4, an anchorhead in a tendon supplied to the Midland Plant, and its associated documentation, were identified with an incorrect heat code. In April 1981, Inryco became aware that seven anchorheads which were identified as Heat Code NC, were actually Heat Code LP. Inryco failed to notify or write a nonconformance report to the customer pertaining to the anchorhead supplied to Midland until after this was identified by the NRC inspector on July 14, 1981.

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and QA Manual Title XVII, heat treat records, inspection records, and a material supplier's Certificate of Material Analysis, pertaining to material used for anchorheads supplied to the Midland and Bellefonte Nuclear Plants, documented a grade of material that was different from the grade stated on the material manufacturer's Certified Mill Test Report.

5. Contrary to committed corrective actions in the Inryco letters of March 23 and June 26, 1981, the review of existing records and closeout of the identified nonconformance reports had not been performed as of the date of this inspection.

C. UNRESOLVED ITEMS:

None.

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Nonconformance Item A (Report No. 80-01): This item dealt with a buttonhead machine operator's not buttonheading the three sample wires on both ends and checking them for configuration with Specification No. 1610.

   Inryco QC Engineering issued a letter to Manufacturing on November 26, 1980, supplemented by Nonconformance Report No. 781-28, dated December 9, 1980, pertaining to the above. The NRC inspector reviewed the Buttonhead Machine Qualification Log to verify the performance and recording of the required six buttonhead checks.

2. (Open) Nonconformance Item B (Report No. 80-01):

   a. Part B.1: This item dealt with the NC/CA form not providing for identification of the cause of nonconforming conditions.

      Inryco has revised Title XV and XVI of the QA Manual for clarification of intent and to afford better controls for nonconformance/corrective action activities; however, the required customer approvals for changes to the QA Manual have not yet been received. These changes have consequently not yet been incorporated into the QA Manual.

   b. Part B.2: This item dealt with NC/CAs not documenting dispositions of nonconformances and corrective actions, and approval blocks not being signed by the appropriate personnel.

      The specific NC/CAs identified in Report No. 80-01 had not been corrected. Nonconformance B.5 was identified during this inspection as a result of Inryco's failure to implement the committed corrective actions.

3. (Closed) Nonconformance C (Report No. 80-01): This item dealt with the voiding of a nonconformance report pertaining to 17 nonconforming coils of wire without evaluation being performed by an appropriate authority, and the failure to generate a nonconformance report for over 45 coils of wire which were identified by a hold tag as being nonconforming.

   This item has been closed and replaced by a nonconformance with corrective action commitments (B.2), concerning the failure to initiate a nonconformance report within 30 days after identification of bushing dimensional measurements that were discrepant with the requirements of Quality Control Procedure No. 5.2.6-781, Revision 3.

4. (Closed) Nonconformance D (Report No. 80-01): This item dealt with calibration readings of stressing rams being taken at values different from those specified by Calibration Procedure No. Q675-G.

   Calibration Procedure No. Q675-G had been voided by Inryco, however, it was still maintained in the QC Manuals for the Bellefonte and Midland projects. It was determined during this inspection, that procedure QA9.1.G was used for the calibration of the stressing rams used at Bellefonte and Midland, and the values taken for these rams were consistent with the requirements of this procedure.

5. (Closed) Nonconformance E (Report No. 80-01): This item dealt with the failure to have certifications stating the proficiency, training or qualifications of certain QC inspection personnel.

   Inryco has implemented the committed corrective actions in that all QC inspector's files now contain the required certificates and the documented, supplemental training sessions.

6. (Closed) Nonconformance F (Report No. 80-01): This item dealt with Inryco's failure to document the methods used to select, evaluate, and qualify certain suppliers. In addition, certain suppliers were listed as being qualified for nuclear safety-related work when, in fact, evidence was not available to demonstrate this.

   Inryco has documented the methods used to select, evaluate, and qualify the suppliers and the Approved Vendors List format has been changed to more clearly reflect the categories of vendor qualification.

7. (Closed) Nonconformance G (Report No. 80-01): This item dealt with certain heat treatments not being performed in accordance with the specified heat treatment procedure.

   Inryco has developed and implemented Heat Treat Procedure No. PT 5.2.1 which supersedes HT-101 and eliminates the ambiguities that existed previously.

8. (Resolved) Unresolved Item, Details Section, paragraph E.3.b., (Report No. 80-01): This item dealt with the apparent unfamiliarity of Engineering Section personnel with the design control measures stated in the Inryco QA Manual and project QC Manuals.

   This item was resolved by review of the design control requirements contained in the QA Manual and Procedure No. PTP 1, Revision 4 (SNUPPS Project QC Manual) and an evaluation made of compliance in regard to the technical requirements of Bechtel Specification No. 10466-C-155(Q), Revision 8.

9. (Resolved) Unresolved Item, Details Section, paragraph H.3.b., (Report No. 80-01): This item dealt with QA/QC personnel being procedurally allowed to perform certain engineering computations, but discussions disclosed that they did not understand the method of analysis used in stressing ram calibrations.

   Inryco developed and implemented stressing ram calibration Procedure No. QA 12.8.H which supersedes previous procedures and eliminates the reference to QA/QC personnel performing engineering computations.

E. OTHER FINDINGS OR COMMENTS

1. 10 CFR Part 50.55(e) Construction Deficiency Report (CDR):

   This CDR dealt with questionable heat traceability for anchorhead material supplied to TVA's Bellefonte Nuclear Plant, Units 1 and 2. Inryco performed an investigation and documented the results. The results of the investigation and recommended corrective actions were submitted to TVA on Supplier Nonconformance Report (NCR) No. 7 dated October 24, 1980. As of this inspection, TVA had not formally approved NCR No. 7. As a result of the NRC inspector's review of this item, a nonconformance was identified (See paragraph B.3).

2. 10 CFR Part 50.55(e) CDR:

   This CDR dealt with Inryco not providing certified material test reports for several heats of anchorhead material supplied to Bellefonte Nuclear Plant, Units 1 and 2. Inryco procured material from a material supplier, who transcribed information from the material manufacturer's Certified Material Test Report (CMTR) onto their Certificate of Material Analysis, which was supplied to TVA. TVA's contract with Inryco imposed the April 1973, Trial Use Version of the American Concrete Institute 359 Code which requires CMTRs for all load bearing components in the prestressing system. Inryco has provided all necessary CMTRs to TVA.

   As a result of the NRC inspector's review of this item, a nonconformance was identified (See paragraph B.4).

3. 10 CFR Part 50.55(e) CDRs:

   These CDRs dealt with: (a) dimensional nonconformances in field bushings which were identified at Braidwood, Unit 1, as a result of investigation of the reasons for a bushing thread failure during tendon stressing; and (b) the subsequent identification of dimensional nonconformances in anchorage material furnished to Bellefonte, Units 1 and 2. Inryco has performed an engineering evaluation of dimensional

requirements, documented the requirements in a procedure, and implemented a 100% inspection program of control dimensions for existing and unstressed materials. During review of this subject, the NRC inspector identified one violation (see paragraph A) and two nonconformances (see paragraphs B.1 and B.2).

4. Follow Up On Previous Inspection Findings

Six out of seven previous inspection findings were closed during this inspection. The two previously identified unresolved items have been resolved. During review of the finding that remains open, a nonconformance against committed corrective actions was identified (See paragraph B.5).

5. Comment

During review of the previous inspection finding addressed in paragraph D.6, it was identified that the probable cause was due to the manner in which the QA Manual was written pertaining to procurement source evaluation. During discussion of this item, Inryco agreed to evaluate and revise this area to eliminate certain ambiguities. It should be pointed out, however, that Inryco's customers have accepted the existing version.

ORGANIZATION: KLOCKNER-MOELLER, ATLANTA PLANT
MARIETTA, GEORGIA

REPORT NO.: 99900757/81-01	INSPECTION DATE(S): 9/29-30/81	INSPECTION ON-SITE HOURS: 12

CORRESPONDENCE ADDRESS: Klockner-Moeller
Atlanta Plant
ATTN: Mr. H. P. Bearer
Technical Manager
1176 Franklin Road
Marietta, GA 30067

ORGANIZATION CONTACT: Mr. H. P. Bearer, Technical Manager
TELEPHONE: (404) 952-0258

PRINCIPAL PRODUCT: Motor Control Centers

NUCLEAR INDUSTRY ACTIVITY: Klockner-Moeller, Atlanta Plant, completed fabrication of Motor Control Centers for the Grand Gulf Nuclear Station in 1978. This has been, to date, their only nuclear contract.

ASSIGNED INSPECTOR: I. Barnes for H. W. Roberds, Reactive Inspection Section (RIS) — Date: 11-18-81

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes, Chief RIS — Date: 11-18-81

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made as a result of the identification at the Grand Gulf Nuclear Station of: (1) 24-inch starter/breaker plug-in drawers installed in 480 volt Motor Control Centers not being seismically qualified; (2) electrical faults in size 3 starters; and (3) use of improper screw sizes in 480 volt Motor Control Center starter relays.

ORGANIZATION: KLOCKNER-MOELLER, ATLANTA PLANT
MARIETTA, GEORGIA

REPORT NO.: 99900757/81-01	INSPECTION RESULTS:	PAGE 2 of 2

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS AND COMMENTS:

1. Starter Drawer Not Seismically Qualified - Klockner-Moeller (K-M) fabricated and shipped one 24-inch starter drawer to Grand Gulf Unit 1 which was not seismically qualified as required by Bechtel Power Corporation purchase order No. 9645-F-26167. This discrepancy was identified by K-M personnel and reported to the Nuclear Regulatory Commission on March 13, 1981. This discrepancy occurred as a result of the purchase of a nonstandard 24-inch starter drawer and an oversight by K-M personnel who reviewed the purchase order. To correct the deficiency, the unqualified 24-inch starter drawer was replaced with the standard seismically qualified 18-inch drawer. To prevent a recurrence of this deficiency K-M requires that all nuclear purchase orders be reviewed by the Technical Manager and the Quality Control Engineer for quality requirements.

2. Electrical Faults In Size 3 Starters - This condition was caused by the use of an improper length of phase wires in a nonstandard 24-inch drawer. The phase wires were too short to provide adequate relief and resulted in abrasion of the insulation by the bus barrier every time the breaker was racked in or out. To correct this deficiency, K-M replaced the 24-inch starter drawer with an 18-inch starter drawer with adequate length of the phase wires to prevent abrasion by the bus barrier. To prevent a recurrence of this deficiency, a design change was made in 1978 to the starter drawers to eliminate the phase wires.

3. Improper screw sizes in 480 volt Motor Control Center Starter Relays This condition was identified as a result of an investigation into the reasons why a vapor exhaust fan in the Lube Oil Conditioning and Storage System failed to start during system testing. The failure was established to have been caused by the use of a 3/8-inch length screw in place of the required 1/4-inch length screw in a DILO-22-NA contactor. When tightened, the longer screw bottomed out before the terminal connection was tight with the resulting loose connection causing the relay failure. K-M was not aware of this discrepancy despite the licensee's potential 10 CFR Part 50.55(e) report indicating that examples of the failed relays had been sent to the vendor for investigation and evaluation.

ORGANIZATION: NAMCO CONTROLS DIVISION
ACME CLEVELAND CORPORATION
JEFFERSON, OHIO

REPORT NO.: 99900378/81-01	INSPECTION DATE(S): 10/12-16/81	INSPECTION ON-SITE HOURS: 56

CORRESPONDENCE ADDRESS: NAMCO Controls Division
Acme - Cleveland Corporation
ATTN: Mr. N. E. Swanson
President
149 Cucumber St.
Jefferson, Ohio 44047

ORGANIZATION CONTACT: Mr. J. Bentley, Manager-Quality Assurance
TELEPHONE: (216) 576-4070

PRINCIPAL PRODUCT: Limit Switches.

NUCLEAR INDUSTRY ACTIVITY: It is expected that 805 shippers (purchase orders/contracts) for switches will be processed between October 1, 1981, and September 30, 1982.

ASSIGNED INSPECTOR: J Barnes for W. E. Foster, Reactive Inspection Section (RIS) — 12-2-81 Date

OTHER INSPECTOR(S): L. B. Parker, RIS

APPROVED BY: J Barnes — 12-2-81 Date
I. Barnes, Chief, RIS

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B; 10 CFR Part 21; and other NRC requirements.

B. SCOPE: This inspection was conducted as a result of: (1) identification of intermittent operation of limit switches; and (2) concerns expressed by Region III of the U.S. Nuclear Regulatory Commission, regarding adequacy of the NAMCO quality assurance program. Inspection areas selected to evaluate the foregoing were: QA reinspection; manufacturing process control; and change control. Control of measuring and test equipment and follow up on nonconformances were also evaluated.

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ORGANIZATION: NAMCO CONTROLS DIVISION
ACME CLEVELAND CORPORATION
JEFFERSON, OHIO

REPORT NO.: 99900378/81-01	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATIONS:

1. Contrary to paragraph 21.6 of 10 CFR Part 21, a current copy of 10 CFR Part 21 was not posted.

2. Contrary to paragraph 21.21 of 10 CFR Part 21, procedures had not been adopted to implement 10 CFR Part 21.

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraph 2.2.1, its subparagraph 2 and paragraph 2.3 of Section 5.0, Revision B, of the QA Manual, Revision C, dated May, 1981, Production Order Travelers had not been controlled to ensure that delivered items are fabricated, processed, and accepted to the latest design configuration in effect; as evidenced by the following conditions noted on the Production Router for Part No. EA742-32701, Production Order No. C21187: (a) an unauthorized deletion on October 12, 1981, of an engineering requirement (Oper. No. 0180-Impregnate and Water Test); and (b) nonaccomplishment of a reaming operation (no. 0090), which had been discontinued for at least two years. Note: The last inspection operation of the Production Router had been stamped and dated.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 5.5 of NAMCO Standard Practice (NSP) No. 60-0007, re-issue date August 1981, nuclear product inspection had not been controlled per Q.C. No. 10-101, as evidenced by lack of documentation required by Q.C. No. 10-101.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and paragraph 6.1 and its subparagraph 1 of Section 20.0, Revision A, of the QA Manual, Revision C, dated May, 1981, final inspection had not been performed to provide conformance to the approved drawing on Lever Shaft, Part No. EA186-00099 for Factory Order No. C26097. Inasmuch as the parts were accepted to an unauthorized changed dimension of .496/.498 inches the inspection record indicated that the parts were within the drawing dimension of .499/.497 inches.

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 6.5.1.2 of NSP No. 40-0003, re-issue date August 1981, nuclear factory orders had not been reviewed by Engineering for engineering documentation currentness just prior to issuing orders to the shop floor. Examples: Factory Order Nos. C26558, C26097 and C25575.

5. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 2.2 of Section 14.0, Revision A, of the QA Manual, Revision C, dated May 1981, the use of calibrated equipment had not been identified in completed travelers for the following hardware items which were processed June 26 through August 6, 1981, and required use of calibrated equipment during assembly and test: (a) Assembly Number (AN) EA180-31302, Factory Order Number (FON) C-26097; (b) AN EA180-32302, FON C-26558; and (c) AN-EA740-20000,

FONs C25575, and C24879. The calibrated equipment consisted of torque screwdrivers, gauges and electrical test fixtures.

6. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 5.2.4 of QA Manual Section 15.0, Inspection Report 3406393 was not signed off by the manufacturing, production control, and engineering representatives of the material review board.

7. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and paragraph 2.4 of QA Manual Section 6.0, changes to NAMCO Standard Procedures (NSP) are not controlled. Example: NSP 20-0001 sign off sheet shows final approval on October 17, 1980, however, NSP 20-0001 sheet 2 indicates an unapproved reissue date of August, 1981.

8. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraphs 3.1.1 and 3.1.2 of QA Manual Section 18, Revision B, the yearly audit schedule and quality element checklists had not been prepared.

C. UNRESOLVED ITEMS:

1. NSP-60-0006 paragraph 5.1.3 states that internal audits will be performed at least annually, while NQAM Section 18 paragraph 2.2 sets the interval at 36 months.

2. NAMCO Controls Engineering Department Procedures dated April 18, 1980, paragraph 4.2.2 does not impose the use of the same engineering change control order as does NQAM Section 3.0 paragraph 4.2.

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

(Open) Deviation (80-01): Failure to provide documented procedures in the areas of: auditing, purchasing, material storage, engineering and calibration. Procedures have been written but not implemented as written for internal audits (see nonconformance 8). Procedures have been written and implemented for engineering changes and design review, a material review board, calibration, procurement control, and material storage.

E. OTHER FINDINGS OR COMMENTS:

1. Manufacturing Process Control - NAMCO Standard Practice No. QC 10-101, dated October 1, 1979, establishes sampling plans and procedures for inspection of "items used in Nuclear Applications." It also states the inspection results must be recorded on specific forms identified in the document. The inspector was informed that the program had not been implemented.

   a. The Inspection Record for the Lever Shaft, reflected an ink change on the diameter from .499/.497 inches to .498/.496 inches. There was no engineering documentation to authorize the change. In the final analysis, the Inspection Record indicated the parts were within

the drawing dimensions of .499/.497 inches.

c. The Production Planner requisitions engineering documents from the Secretary/Clerk - Engineering just prior to issuing the orders to the shop floor as opposed to review by Engineering.

d. The 11 switches that exhibited intermittent operation at the Quad-Cities Nuclear Power Station were received at NAMCO controls on Returned Goods Report (RGR) No. 5891, dated May 7, 1981. Remarks in the RGR indicated confirmation of intermittent operation, however, the test voltage was not shown.

Records indicate that the returned switches were upgraded to Revision H (from Revision G) and shipped to Commonwwalth Edison on May 28, 1981. The Assembly Procedure required an electrical test at 6 volts direct current, 100 milliampers.

2. QA Reinspection - The Quality Assurance Manual Revision Record indicates that the Manual, dated May 1981, is a complete revision, and correlates with Appendix B of 10 CFR Part 50. All of the NAMCO Standard Practices (18) are dated from October 1980 through July 1981; with nine of them exhibiting a reissue date of August 1981.

3. Control of Measuring and Test Equipment - Procedures (2) and records (9) were inspected in this area. The procedures were implemented. The records inspected were current and, where applicable, traceable to the National Bureau of Standards.

4. Change Control - Procedures (16) and records (24) were inspected in this area. Design fabrication and inspection change control procedures were delineated and implemented, except for deficiencies noted.

ORGANIZATION: NPS INDUSTRIES, INC.
AUSTIN, TEXAS

REPORT NO.: 99900348/81-01	**INSPECTION DATE(S)**: 8/17-21/81	**INSPECTION ON-SITE HOURS**: 31

CORRESPONDENCE ADDRESS: NPS Industries, Inc.
ATTN: Mr. L. R. Walker
Plant Manager of Quality Assurance
10420 Metric Boulevard
Austin, TX 78758

ORGANIZATION CONTACT: Mr. L. R. Walker, Plant Manager of Quality Assurance
TELEPHONE: (512) 836-4161

PRINCIPAL PRODUCT: Component Supports

NUCLEAR INDUSTRY ACTIVITY: Three major contracts represent approximately 80% of the total workload. Another 10% of the total workload is for the supply of miscellaneous items in response to small purchase orders.

ASSIGNED INSPECTOR: Ross L. Brown 9/1/81
Ross L. Brown, Component Section (CS) Date

OTHER INSPECTOR(S):

APPROVED BY: U. Potapovs 9-21-81
U. Potapovs, Acting Chief, CS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: Management meeting and implementation of 10 CFR Part 50, Appendix B, including manufacturing process control, change control, control of nonconformances and corrective actions, audits, and status of previous inspection findings.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

Contrary to 10 CFR Part 50, Appendix B, Criterion V, and Section 16.0 of the NPS Industries, Inc. (NPSI) QA Manual, corrective action requests (CARs) did not record the fact that the Manager of QA had determined the cause of the nonconformity that initiated the CAR; however, prior to the conclusion of the inspection NPSI had revised the CAR form to provide for and require the cause of the deficiency to be recorded, and Work Procedure No. 16.0.1 was revised to describe the method to be used to complete this part of the CAR.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Deviation A (79-01): The audit status log showed several audit deficiencies had been closed when, in fact, all had not been signed off.

   The audit finding and the 1981 audit schedule that identifies the program element to be audited, date of audit, date audit findings were completed and reaudit, if applicable, verified conformance with the established requirements. The qualification records for two auditors verified that the audits were performed by qualified auditors.

2. (Closed) Deviation B (79-01): Two WPSs had not been approved and the PQRs did not list the WPS revision or an obsolete revision was listed.

   Review of seven WPSs and six PQRs verified the listing of appropriate revision and proper approval signature.

3. (Closed) Deviation C (79-01): Certification for liquid penetrant materials were not available and certifications for these materials were not required in the purchase order.

   NCR No. A15-091 verified that the developer was discarded (material could not be identified).

   The material requisition, purchase order, material receiving report, and material certificates verified conformances with specified requirements.

4. (Closed) Unresolved Item K.3.b (79-01): Procedure for inspecting and documenting code welding on a WDS had not been issued.

   Work Procedure No. 9.3.5., Revision 1, was issued, and the weld data sheets verified proper preparation, use, review, and approval of the WDS in accordance with the work procedure.

E. OTHER FINDINGS OR COMMENTS:

1. Manufacturing Process Control - The QA Manual establishes the controls and requirements applicable to the manufacture of parts, appurtenances, piping subassemblies, and tubular products in compliance with the code, specification, and regulatory requirements.

   Review of in-process and final documentation (WDSs, material tracer, and final inspection check lists) verified conformance with the program requirements.

2. Change Control - NPS Industries, Inc., Austin, Texas, plant does shop detail work only (all design engineering functions are performed by others).

   The QA Manual requires changes which effect the validity of the support design or manufacturing documents to be subjected to the same review and approval as the original.

   Review of customer releases, change requests, manufacturing releases, and document control logs verified conformance with the program requirements.

3. Audits - The QA Manual establishes the requirements for a system of planned and periodic audits performed in accordance with an approved check list per an established schedule by qualified personnel.

   The work procedure defines the method of conducting the internal audits.

   Review of the audit schedule, audit finding sheets, audit check lists, and management audit report verified conformance with the program requirements (additional information in Paragraph D.1).

4. Control of Nonconformances and Corrective Action

   a. The QA Manual establishes the requirements to identify and control nonconforming material and items to prevent their inadvertent use. It also assigns the responsibilities for the identification, documentation, disposition, and the review and approval of the nonconformance.

Review of the report log and three nonconformance reports verified compliance with the program requirements.

b. QA Manual Section 16.0 establishes the requirement for identifying and reporting significant conditions adverse to quality. This requirement includes investigation and determination of the cause of the condition, and the documentation of these activities.

Review of the CARs verified that adverse conditions are identified and reported, also that follow up action, to verify that the assigned corrective actions has been implemented, is being performed.

However, the CAR form did not provide a space to document the assigned cause of the condition, therefore, the CARs or other documents related to adverse condition did not record the fact that the cause of the nonconformity had been determined (see paragraph B. for nonconformance).

ORGANIZATION: NUCLEAR ENERGY SERVICES, INCORPORATED
NES DIVISION
DANBURY, CONNECTICUT

REPORT NO.: 99900762/81-01	INSPECTION DATE(S): 10/20-23/81	INSPECTION ON-SITE HOURS: 78

CORRESPONDENCE ADDRESS: Nuclear Energy Services, Inc.
NES Division
ATTN: Mr. W. J. Manion
President
1000 Shelter Rock Road
Danbury, CT 06810

ORGANIZATION CONTACT: Mr. V. J. Potent, Manager, Quality Assurance
TELEPHONE: (203) 748-3581

PRINCIPAL PRODUCT: Engineering and NDE Services, and fuel rack fabrication.

NUCLEAR INDUSTRY ACTIVITY: NES is heavily involved in Preservice and Inservice inspections of nuclear power plants and also provides engineering services pertaining to decommissioning and nuclear waste management programs. Another area of activity is the fabrication of spent fuel racks and fuel handling tools.

ASSIGNED INSPECTOR: L. E. Ellershaw, Reactive Inspection Section (RIS) — Date: 12/8/81

OTHER INSPECTOR(S): D. D. Chamberlain, Reactor Systems Section (RSS)
H. W. Roberds, RIS

APPROVED BY: I. Barnes, Chief, RIS — Date: 12/8/81

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made at the request of Region I of the NRC as a result of concerns pertaining to the fabrication of fuel racks provided to Baltimore Gas & Electric Company's Calvert Cliffs Nuclear Power Plant, Unit 1. Additional areas selected for inspection included: internal audits, control of nonconformances and corrective action; review of welding procedure specifications; design control; control of NDE personnel qualification certifications, and a limited review of procurement document control.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and QA Manual Section 18, a review of all audits revealed that each section of the manual had not been audited at least once per year, in that only 2 of 18 sections were audited in 1980, and 3 of 18 have been audited thus far in 1981.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and QA Manual Section 18, the auditor performing one of the two audits in 1980, was not qualified to audit, in that he had joined NES just two months prior to performing the audit and had not participated in the five required audits necessary to be certified as a lead auditor.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Specification No. 80A9008, a review of 14 Suppliers Nonconformance Reports (SNR) pertaining to welding performed on Calvert Cliffs Nuclear Power Plant, Unit 1, fuel racks revealed the following:

   a. In at least eight cases, the cause of the nonconformances was not documented.

   b. In four cases, the preventive measures had not been addressed.

   c. A review of related supplier audits did not show that complete compliance with the SNR dispositions and corrective actions had been accomplished and verified.

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and ASME Code Section IX, a review of supplier welding procedure specifications (WPS) revealed:

   a. Three of four WPSs used during fabrication of fuel racks for Calvert Cliffs, Unit 1, permitted unqualified changes in ASME Code essential variables pertaining to changes in specified percentage gas composition for GMAW WPSs, and failure to address pre-heat temperatures for a GTAW WPS. These WPSs had been approved by NES.

   b. Two GMAW WPSs (low voltage, short circuiting mode of metal transfer) allowed a base metal thickness to be welded which was greater than 1.1 times that of the qualification test coupon. These WPSs had been approved by both NES and Consolidated Edison Company of N.Y., Inc., for use on fuel rack handling tools for Indian Point Station, Unit 2.

5. Contrary to Section 2.4.1 of Quality Assurance Manual 80A9002, a QA plan for the LaCrosse Boiling Water Reactor (LACBWR) project was not issued as early as practicable in the course of the project.

6. Contrary to Section 5.0 of Design Calculation Notebook Procedure 80A9004, the Design Calculation Notebook for Task 5101-052 (LACBWR Project) did not contain the following:

   a. Statement of the problem

   b. List of applicable criteria

   c. References to sources of data

   d. Specific assmptions

7. Contrary to Section 6.0 of Design Calculation Notebook Procedure 80A9004, Battery Charger Equipment Anchorage Calculation (page 14) was not independently checked by a qualified person prior to issuing approved design sketch SK-5101-063-7 (LACBWR Project).

8. Contrary to Section 4.0 of Computer Code Documentation Control Procedure 80A9010, the Master Code List, Code File Index, and/or Code Identification was not maintained as required for certain computer codes.

9. Contrary to Section 2.4.5 of QA Manual 80A9002 and Section 2.5.2 of QA Manual 80A9021, two engineering personnel on one project had not attended QA training sessions where instruction was given in the workings of the NES Quality Assurance Manual and Implementing Procedures, and four NDE technical personnel had not participated in indoctrination and training programs to become familiar with the purpose and intent of regulations, codes, standards, and NES Quality Assurance documents.

10. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 10.2 of SNT-TC-1A (June 1975 Edition), Procedure for Training and Certification of Nondestructive examination Personnel, 99-CNTP-001 states that personnel can be recertified within one year of termination which is six months in excess of the time specified in SNT-TC-1A June 1975 Edition.

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Internal Audits (L. E. Ellershaw) - This area was inspected by reviewing QA Manual and applicable implementing procedures to determine QA program requirements. Sixty-four audits from January 1980, to present, were reviewed in addition to the qualification records of the five auditors performing the audits. It was determined that most of these audits were vendor audits rather than internal audits. Nonconformances B.1 and B.2 were identified.

2. Control of Nonconformances and Corrective Actions (L. E. Ellershaw) - This area was inspected by reviewing QA Manual and applicable implementing procedures to determine QA program requirements. The 61 Supplier Nonconformance

Reports (SNR) dealing with the fabrication of Calvert Cliffs, Unit 1, spent fuel storage racks were reviewed and 14 were determined to have been generated due to nonconforming welds. Review of the 14 SNRs resulted in Nonconformance B.3 being identified.

3. Review of Welding Procedure Specifications (L. E. Ellershaw) - This area was inspected by reviewing QA Manual and applicable implementing procedures. The equipment specifications pertaining to Calvert Cliffs, Unit 1, and Indian Point Station, Unit 2, were reviewed to determine the applicable welding codes. Six vendor Welding Procedure Specifications and their supporting Procedure Qualification Records were reviewed. Nonconformance B.4 was identified.

4. Follow-Up Inspection Item (L. E. Ellershaw) - In addition to the items stated in D.2 and D.3 above, a supplier's inspection records and certificates of conformance pertaining to the fuel racks provided to Calvert Cliffs, Unit 1, were also reviewed. As a result, an item requiring follow-up was identified. The inspection records of Metal Products Corporation (MPC) showed that WPSs QC-PPS-219-5, 233-3, 237-2, and 254-1 were used in fabricating fuel racks, Serial Numbers 001 through 009. MPC's Certificates of Conformance showed that welding was accomplished on Serial Numbers 001 through 006 and 008-009, using WPSs QC-PPS-219-5, and 254-1, with Serial Number 007 being welded by using 219-5, 254-1, 233-3, and 237-2. Suppliers Nonconformance Report No. 55 pertaining to Serial Numbers 006 through 009, shows the disposition to be repair welding per QC-PPS-216-3.

5. Design Control (D. D. Chamberlain) - The NES Quality Assurance Manual 80A9002 and applicable implementing procedures were examined to determine QA program requirements. Five project task plans, 2 QA program plans, 5 design reports, 4 design calculation notebooks, the Master Computer Code List, 5 computer code files, and the available quality assurance training attendance lists were examined to verify implementation of the QA program requirements. The documents examined related to design activities on two projects and the general areas of computer codes and QA indoctrination and training. Nonconformances B.5 through B.9 were identified in this area of the inspection.

6. Control of NDE Personnel Qualification and Certification (H. W. Roberds) - This area was inspected by reviewing the Quality Assurance Manual and implementing procedures. Twelve personnel qualification and certification record packages were examined of personnel qualified in the disciplines of UT, RT, MT, PT, and VT. Nonconformance B.10 was identified and, in addition, the following observations were made:

   a. The present personnel qualification and certification procedure is not in full compliance with Section XI of the ASME Code in that the present procedure allows recertification of NDE personnel every three years by evidence of continuing satisfactory performance. Section XI requires all levels of NDE personnel be recertified by examination. Review of personnel qualification records indicated, however, that personnel involved in Section XI inspections had been recertified by examination. NES agreed to revise their qualification and certification procedure to meet the requirements of Section XI.

b. The personnel qualification and certification procedures and records do not clearly define or indicate who or how prior work experience of individuals is verified to assure compliance with the requirements of SNT-TC-1A.

7. Procurement Document Control (H. W. Roberds) - This area was inspected by reviewing the applicable sections of the Quality Assurance Manual and implementing procedures. Four purchase orders and the approved vendors list were reviewed for compliance with QA program requirements. The purchase orders reviewed did invoke 10 CFR Part 21 and appeared to meet the requirements of the QA program.

ORGANIZATION: NUCLEAR TECHNOLOGY, INC.
SAN JOSE, CALIFORNIA

REPORT NO.: 99900517/81-01	INSPECTION DATE(S): 7/6-7/81	INSPECTION ON-SITE HOURS: 30

CORRESPONDENCE ADDRESS: Nuclear Technology, Inc.
ATTN: Mr. E. Keever
President
6835 Via Del Oro
San Jose, CA 95119

ORGANIZATION CONTACT: Mr. W. S. Gibbons, QA Administrator
TELEPHONE: (408) 629-9800

PRINCIPAL PRODUCT: Engineering Consultant Activities

NUCLEAR INDUSTRY ACTIVITY: Nuclear Technology, Inc. currently has 34 contracts involving 56 domestic reactor units for various engineering consultant activities such as piping analysis, steel containment vessel design and analysis, containment modification design and analysis, mechanical and electrical equipment evaluation/qualification, system/component performance analysis and design, and materials/welding/QA/ISI consulting.

ASSIGNED INSPECTOR: R. H. Brickley 9/21/81
R. H. Brickley, Reactor Systems Section (RSS) Date

OTHER INSPECTOR(S): U. Potapovs, VIB; I. T. Yin, RIII;
D. H. Danielson, RIII (Observer); J. R. Fair, HQ (Observer).

APPROVED BY: C. J. Hale 9-22-81
C. J. Hale, Chief, RSS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B

B. SCOPE: Initial management meeting, general procedure review, control of computer programs, design verification, and status of previous inspection findings.

A. VIOLATIONS

None

B. NONCONFORMANCES

None

C. UNRESOLVED ITEMS

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS

The status of previous inspection findings identified in Inspection Reports No. 50-263/79-16 and 50-263/80-01 will be documented in a Docket No. 50-263 inspection report.

E. OTHER FINDINGS OR COMMENTS

1. Initial Management Meeting - A meeting was conducted with the management of Nuclear Technology, Inc. to acquaint them with the Licensee Contractor Vendor Inspection Program (LCVIP), the NRC organization relative to the Vendor Inspection Branch, implementation of the LCVIP, and the types of documents generated and processed in implementing the program.

2. General Procedure Review - The inspector reviewed 58% of the 19 procedures contained in the Quality Engineering Procedure Manual to determine that the requirements of Criterion V of Appendix B to 10 CFR Part 50 were implemented. The inspector determined that procedures had been established to control the applicable activities identified in Appendix B to 10 CFR Part 50.

3. Control of Computer Programs - The User and Theoretical Manuals for three computer programs (KCYLNOZ, NUTSHEL, and LOCAJET) and the User Manual for one computer program (STARDYNE) were examined for QA program implementation and technical content. The User and Theoretical Manuals were examined to verify that they contained sufficient instructions to run the program and provide a detailed description of the mathematical models, empirical data, assumptions, and applicable references. The verification reports on three computer programs (KCYLNOZ, NUTSHELL, and LOCAJET) were examined to verify that they contained: (1) a description of the program version and options validated; (2) test (benchmark) problems including boundary conditions, mathematical model, and key parameters; and (3) an evaluation of the program validity with an analysis of any

identified errors. The verification of STARDYNE was performed by the vendor who submitted a certification to this effect.

4. Design Verification - The verification analysis and/or reviews performed to verify the computer programs identified in E.3 were examined to verify that they were performed and documented in accordance with applicable Quality Engineering Procedures. The inspector noted that the verification analysis for KCYLNOZ had undergone an independent check on July 6, 1981; however, several administrative type entries (page number, total number of pages, title, etc.) had not been made. A follow-up inspection regarding these types of omissions may be conducted during a future inspection.

ORGANIZATION: NUCLEAR VALVE DIVISION, BORG WARNER CORPORATION
VAN NUYS, CALIFORNIA

REPORT NO.: 99900289/81-02	INSPECTION DATE(S): 10/5-9/81	INSPECTION ON-SITE HOURS: 28

CORRESPONDENCE ADDRESS: Nuclear Valve Division
Borg Warner Corporation
ATTN: Mr. A. L. Dubrow
7500 Tyrone Ave.
Van Nuys, California 91409

ORGANIZATION CONTACT: Mr. W. Wheaton, QA Director
TELEPHONE: (213) 781-4000

PRINCIPAL PRODUCT: Nuclear Valves - 2" to 24"

NUCLEAR INDUSTRY ACTIVITY: Commercial nuclear production of the Nuclear Valve Division of Borg Warner Corporation totals 70% of the total company production.

ASSIGNED INSPECTOR: J. W. Sutton — 11-23-81
J. W. Sutton, Reactor Engineer
Components Section (CS)
Date

OTHER INSPECTOR(S):

APPROVED BY: U. Potapovs — 11-30-81
U. Potapovs, Acting Section Chief, CS
Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B; 10 CFR Part 21; and applicable codes and standards.

B. SCOPE: Previous inspection findings, Part 21 inspection, welding, review of vendor's activities and review of vendor's action on a reported 10 CFR Part 50.55(e) notification from Duke Power Company pertaining to a binding 8" gate valve problem at Catawba 1-2 plants.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 9.8 "Welding" in Section 9, Revision L of the Nuclear Valve Division QA Manual, a welder was observed not maintaining the approved welding procedures electrical characteristics during a hardfacing operation on Valve No. S012579-3.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 15.7 of Section 15, Revision L of NVD's QA Manual and Nuclear Practice Bulletin No. 11-8, Revision 8, a special review board was not convened as required, to review the reported deviation involving 8" gate valves as reported on a Part 50.55(e) report by Duke Power Company.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Open) Potential Construction Deficiency Report (Report No. 80-03, D): The inspector reviewed the corrective action taken by NVD to resolve this problem. All items have been reviewed by NVD and the customer. Action is being taken to finalize the corrective action to be taken within the next 2 months. A final review will be made during the next scheduled inspection.

2. Follow-up Item No. 1 (Closed): NVD Statement of Authority and Policy (81-01):

   The inspector reviewed the revised NVD's Statement of Authority and Policy issued April 1, 1981. The statement indicates that the QA Manual meets Part 50, Appendix B requirements for noncode items.

3. Follow-up Item No. 2 (Closed): QA Directors Reporting Channel (81-01): The inspector reviewed Revision L to NVD's QA Manual issued April 1, 1981. The revision now indicates the current reporting channel for use by the Director of QA to management.

E. OTHER FINDINGS OR COMMENTS:

1. Implementation of 10 CFR Part 21: During the review of the corrective action taken by NVD to resolve the binding problem on 8" gate valves as reported by Duke Power Corporation as a Part 50.55(e) report, the inspector noted that a Special Review Board had not been convened to determine

the reportability of a defect to NRC under Part 21 requirements. Section 15 of the QA Manual and NVD's Nuclear Practice Bulletin No. 11-8 have detailed procedures that cover this area of reportability.

One nonconformance was identified (See paragraph B.2).

2. Welding: The inspector reviewed NVD's QA Manual Section 9.8 to determine if a system exists to control the welding operations performed during the manufacturing process.

The inspector reviewed 3 welding procedures, welding controls, welder certifications and controls of materials to determine if the system was being implemented.

During the examination of a valve hardfacing operation it was noted that the welder was performing the operation outside of the designated electrical parameters. Welding Procedure NPS 70046 Revision X indicated a current range for 1/8 rod between 70-100 amps. Contrary to this range the welder was performing the operation at 140 amps.

The hardfacing operation was suspended to resolve this problem. One nonconformance was identified (See paragraph B.1.).

3. 10 CFR Part 50.55(e) Report: A 10 CFR Part 50.55(e) construction deficiency report (CDR) notification was made by Duke Power Corporation to NRC on July 1, 1981, pertaining to 2-8" gate valves used for isolating essential from nonessential loads. The valves were found to be inoperable in a component system at Catawba 1-2 units.

NVD assigned a project engineer to determine the cause of the failure. One valve was returned to NVD for examination. A test procedure was generated and tests were performed on the valve during July and August. NVD determined that the valve in question and similar valves that had been manufactured by NVD prior to January 1979 had sharp edges on the gate guide surfaces and if positioned between $22\frac{1}{2}^{o}$ and $157\frac{1}{2}^{o}$ of vertical could fail to open or close.

A search of NVD records for all gate valves manufactured prior to January 1979 in sizes 6, 8, 10, 12, 18 and 20 inches was conducted to determine which valves could be suspect as having this defect. In addition a review of customers who had ordered gate valves in these sizes was also conducted. The search identified 109 gate valves of varying sizes which could be suspect as having the identified defect. Eight customers were identified as having ordered gate valves of varying sizes. A letter was prepared for the affected customers outlining steps to be taken by them to determine if any valves had been installed in a safety system and positioned between $22\frac{1}{2}^{o}$ and $157\frac{1}{2}^{o}$ of vertical.

The customers were requested to transmit all information concerning use and operations of the valves to NVD as soon as possible.

It was also determined by NVD that there were no operating nuclear plants identified as having questionable valves installed in Safety Systems.

A Part 21 notification was submitted to Region V on October 13, 1981, detailing the conditions found and corrective action to be taken for those gate valves identified by customers and installed in safety-related systems and positioned as described in the customers letter.

Follow-up by Region V will continue. One nonconformance was identified. (see paragraph B.2)

ORGANIZATION: PULLMAN POWER PRODUCTS
WILLIAMSPORT, PENNSYLVANIA

REPORT NO.: 99900021/81-01	INSPECTION DATE(S): 10/6-9/81	INSPECTION ON-SITE HOURS: 26

CORRESPONDENCE ADDRESS: Pullman Power Products
ATTN: Mr. T. Daniels, Director
Quality Assurance
P. O. Box 3308, Reach Road
Williamsport, Pennsylvania 17701

ORGANIZATION CONTACT: Mr. T. Daniels, Director, Quality Assurance
TELEPHONE: (717) 323 9991

PRINCIPAL PRODUCT: Nuclear Piping

NUCLEAR INDUSTRY ACTIVITY: Approximately 40% of their work is devoted to the commercial nuclear industry, with most of that effort being provided to Georgia Power Company's Alvin W. Vogtle, Jr. Nuclear Power Plant, Units 1 and 2, and Cleveland Electric Illuminating Company's Perry Nuclear Power Plant, Units 1 and 2.

ASSIGNED INSPECTOR: for L. E. Ellershaw, Reactive Inspection Section (RIS) — 11-5-81 Date

OTHER INSPECTOR(S):

APPROVED BY: for I. Barnes, Chief, RIS — 11-5-81 Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21 and 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made as a result of a 10 CFR Part 21 written notification by Gilbert Associates, Inc., pertaining to mechanical penetration attachment plates provided to Perry, Units 1 and 2, not being impact tested or normalized, and a written request by Office of Inspection and Enforcement, Headquarters, pertaining to questionable impact properties of E7018 and E70S-6 welding materials. Additional areas selected for inspection included: weld material control; welding process control; and manufacturing process control.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and QA Manual Section 3, a Design Specification and its subsequent revisions were reviewed and accepted, in which the necessary data was not in sufficient detail to form the basis for fabrication to the ASME Code and as a result, certain materials used in the fabrication of containment penetration attachment plates for the Perry Nuclear Power Plant had not been impact tested.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and QA Manual Section 8.2; one holding oven contained type 309-16 electrodes in which 1/8" and 5/32" sizes were mixed together, and another oven identified as containing only type 8018 electrodes, also contained type 7018 electrodes of the same size (5/32") mixed together.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50, ASME Code Section IX, and QA Manual Section 9, changes to nonessential variables (amperage and voltage) were being made during in-process SMAW, without the changes being documented either in an amendment to the welding procedure specification (WPS) or a new WPS.

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and QA Manual Section 10, the identification of actual procedures selected for use during fabrication, and their revision dates, has been recorded incorrectly on the process sheets.

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. 10 CFR Part 21 Report - A written notification was made by Gilbert Associates, Inc., (GAI) on April 28, 1981, pertaining to mechanical penetration attachment plates which attach piping to ASME Code Class MC containment penetration sleeves, not being impact tested in accordance with ASME Code, Section III, Subsection NE. Subsequently, Pullman Power Products (PPP) identified the heats of material used in the plate material and had impact tests performed. The material which failed, has been replaced. The GAI design specification did not require impact testing nor did the design drawings specify that impact testing was to be performed.

   Revision XI to the GAI design specification (SP-527-4549-00) dated April 8, 1981, now addresses the material requirements for the plate assemblies. However, it also provides specific requirements for the penetration plates which are contrary to ASME Code requirements. As a result, Nonconformance B.1. was identified.

2. Questionable Impact Properties of Welding Materials - During an NRC inspection at the Perry Nuclear Power Plant, the suitability of certain heats of E70S-6 bare wire and E7018 electrodes for use in ASME Section III components became suspect, due to reported impact test results on Material Test Reports (MTR).

PPP ordered 450 lbs. of 1/16" E70S-6 wire (SFA 5.18) to chemistry only, with physical tests to be performed later by PPP or a vendor. PPP received an initial 50 lbs. of wire for test purposes on June 14, 1976. This was sent to W. B. Coleman Co., a testing laboratory, on purchase order no. 76-15, for the purpose of conducting physical testing in accordance with SFA 5.18. The acceptance criteria for the impact tests is 20 ft. lbs. energy (minimum) at a test temperature of -20 F, which was exceeded by this material. Lateral expansion is not part of the acceptance criteria. PPP decided to upgrade this material to meet the requirements of ASME Section III, NB-2332. Additional wire was sent to W. B. Coleman on purchase order no. 77-94 dated November 29, 1977, for physical testing to meet the requirements of NB-2332, in which lateral expansion is part of the acceptance criteria. The wire was tested at +30 F (the service temperature as stated in the design specification) and met all requirements in both the as-welded and stress relieved conditions, as shown on the Certified Material Test Reports provided by W. B. Coleman, dated November 29, 30, and December 1, 1977.

Three heats of E7018 electrodes were identified as having questionable impact properties. Each heat was tested for impact properties by having five specimens tested in the as-welded condition and a stress relieved condition. Section II C of the ASME Code allows the low and high results for the energy, ft. lbs., to be discarded. These values were reported on the CMTRs. If they had been discarded, the low lateral expansion results would have been eliminated in two of the three cases. The remaining low value, 30 mils lateral expansion, would not be acceptable if these electrodes had been used on based material with fracture toughness requirements and a nominal wall thickness of over 1½", in that the ASME Code requires a minimum of 40 mils lateral expansion. However, this welding material was used on material with a nominal wall thickness of 1½" or less, and the ASME Code requirements in this case is 25 mils lateral expansion. In addition, a review of all nuclear material sheets from the time this welding material was accepted (August 25, 1976) till the time it was depleted (August 30, 1977) and the associated design specifications, revealed there were no special customer requirements for impact testing in excess of ASME Code requirements.

3. Weld Material Control - This area was inspected by review of PPPs procurement, receipt, inspection, storage and issue of welding materials. Included was a review of 20 Certified Material Test Reports and verification of wire/flux combinations testing. During observation of stored welding materials in holding ovens, nonconformance B.2. was identfied.

4. Welding Process Control - This area was inspected by review of five welding procedure specifications and their procedure qualification records, and observation of four in-process SMAW and SAW operations. During observation of SMAW, nonconformance B.3. was identified.

5. Manufacturing Process Control - This area was inspected by review of eight in-process and completed traveler packages including process sheets, shop drawings, and the referenced specifications. Nonconformance B.4. was identified.

ORGANIZATION: RTE CORPORATION, SWITCHGEAR DIVISION
STOCKTON, CALIFORNIA

REPORT NO.: 99900703/81-01	INSPECTION DATE(S): 9/14-17/81	INSPECTION ON-SITE HOURS: 28

CORRESPONDENCE ADDRESS: RTE Corporation
Switchgear Division
ATTN: Mr. H. Schmidt
Deputy Acting Manager
705 N. Carlton Avenue
Stockton, CA 95201

ORGANIZATION CONTACT: Mr. D. R. Prochazka, Manager, QA
TELEPHONE: (209) 466-3621

PRINCIPAL PRODUCT: Generator Control Panels

NUCLEAR INDUSTRY ACTIVITY: Three contracts representing approximately 1% of the total workload.

ASSIGNED INSPECTOR: Ross L. Brown, Components Section (CS) — Date: 10/9/81

OTHER INSPECTOR(S):

APPROVED BY: Uldis Potapovs, Acting Chief, CS — Date: 10-9-81

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B, 10 CFR Part 21 and other applicable standards.

B. SCOPE: Management Meeting and implementation of 10 CFR Part 50, Appendix B, including control of nonconformances and corrective actions, change control, manufacturing process control and status of previous inspection findings.

A. VIOLATION:

None

B. NONCONFORMANCES:

Contrary to 10 CFR Part 50, Appendix B, Criterion V, and Section 16.0 of the RTE Corporation, Switchgear Division (RTE) QA Manual, the majority of discrepancies identified on the Inspection Discrepancy List for Shop Order (SO) 10563 were not initialed as being corrected by the assigned workman.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Violation (80-01): Procedures to implement 10 CFR Part 21 requirements had not been developed.

   The "Procedure for the Implementation of 10 CFR Part 21" was issued to all department managers and was posted on the employee bulletin boards on May 12, 1980.

2. (Closed) Deviation A (80-01): Adequate review of drawing changes was not performed.

   A QA supervisor was added to the staff and included in his responsibilities was document review.

   The inspector's review of five drawings for SO 10577 verified conformance with the program requirements.

3. (Closed) Deviation B (80-01): In-Process Inspection Forms for two units had not been initialed by the inspector.

   Review of eight inspection reports verified conformance with the revised QA Manual that accurately identified the forms in use.

4. (Closed) Unresolved Item D.3.b.(1) (80-01): The QA Manual was revised to correctly identify the test equipment used for testing the finished product that is to be recalibrated at six month intervals.

   Review of the instrument calibration log, six instrument calibration records and six outside laboratory issued certifications of calibration verified conformance with the revised QA Manual section that requires all measuring devices used to determine product compliance to be controlled and calibrated.

5. (Closed) Unresolved Item D.3.b.(2) (80-01): The QA Manual was revised to state in part, the audits shall cover the applicable elements of the QA Program.

   Review of six audit reports verified conformance with the manual requirements.

6. (Closed) Unresolved Item F.3.b. (80-01): The QA Manual was revised to properly identify the forms used as In-Process Inspection Forms (QC-3, QC-4, etc.).

   (Additional information in Paragraph E.2).

E. OTHER FINDINGS OR COMMENTS:

1. Change Control: RTE management stated that at the present time the company is not responsible for the performance of product design for any nuclear contracts and that all changes originate with their customer.

   Review of one Sales Order No. 10577, eight drawing review records, four document transmittals, three customer change notices, four customer document status reports, four test procedures, and five drawings verified compliance with the program that describes the method of entering the customer documents into the system and control of the RTE generated detail drawing, etc., through the plant operations.

2. Manufacturing Process Control: Shop Activities are controlled by the in-process inspection form (travelers).

   Review of five travelers (QC-3, 4, 5, 6 and 17) and one final inspection report for SO 10563 verified that the pertinent manufacturing steps were identified and initialed signifying completion, the assigned witness/hold points were signed and the completed traveler was signed by quality personnel signifying acceptance.

3. Control of Nonconformance and Corrective Action: Review of two inspection Discrepancy Lists and one Inspection Discrepancy Log verified that the discrepant condition was identified, corrective action documented and reported to the top management as required by the Quality Assurance Manual (QAM) Section 15.0.

   Review of the Inspection Discrepancy List for SO 10563 verified that the sign-off of the report was not in accordance with the following requirements of QAM Section 16.0. All discrepancies found in the inspection and test process shall be listed on the Inspection Discrepancy List. Each discrepancy shall be corrected by an assigned workman, who shall initial the Inspection Discrepancy List in the "Corrected by" column. This is a nonconformance. (See paragraph B).

ORGANIZATION: RELIANCE ELECTRIC
CLEVELAND, OHIO

REPORT NO.: 99900756/81-01	INSPECTION DATE(S): 8/31-9/4/81	INSPECTION ON-SITE HOURS: 36

CORRESPONDENCE ADDRESS: Reliance Electric
24701 Euclid Ave.
Cleveland, Ohio 44117

ORGANIZATION CONTACT: Mr. Holland W. Richards, Group Quality Assurance Manager
TELEPHONE: (216) 266-7874

PRINCIPAL PRODUCT: Class IE Induction Motors - 2-1500 HP

NUCLEAR INDUSTRY ACTIVITY: Commercial Nuclear Production of Reliance Electric at two plants totals approximately 1% of total company production.

ASSIGNED INSPECTOR: J. W. Sutton — 11-23-81
J. W. Sutton, Reactor Engineer, Components Section — Date

OTHER INSPECTOR(S): J. R. Agee, Equipment Qualification and Test Engineer

APPROVED BY: U. Potapovs — 11-23-81
U. Potapovs, Chief, VIB — Date

INSPECTION BASES AND SCOPE:

A. Bases: 10 CFR Part 50, Appendix B, and other NRC requirements.

B. Scope: Management meeting, Part 21 inspection, change control, nonconformance/corrective action, audits, and review of vendors activities.

ORGANIZATION: RELIANCE ELECTRIC
CLEVELAND, OHIO

REPORT NO.: 99900756/81-01	INSPECTION RESULTS:	PAGE 2 of 2

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS:

1. The inspector reviewed 10 customer releases, change requests, manufacturing releases and document control logs, and microfiche records to verify conformance with QA program requirements.

2. Control of Nonconformances and Corrective Action - The inspector reviewed the corrective action log and seven corrective action requests to verify compliance with QA program requirements.

3. Audits - The inspector reviewed the corporate audit schedule for Reliance Manufacturing plants, results of five plant audits, the log of audit findings, and three auditors' qualifications records to verify conformance with QA program requirements.

4. Design Control - The inspector reviewed corporate motor designs, drawings, files, specifications and analyses, and materials reports to verify conformance with QA program requirements.

5. Implementation of 10 CFR Part 21 - The inspector reviewed four defect reports generated by Reliance Electric Co., which could result in a Part 21 Report. In all cases Reliance Electric was a subvendor of components parts.

   The reports of defects were taken to final conclusion by Reliance Electric and their customer.

   The inspector determined that the requirements of reporting and posting under 10 CFR Part 21 regulations had been complied with as required by procedures.

ORGANIZATION: THE ROCKBESTOS COMPANY
NEW HAVEN, CONNECTICUT

REPORT NO.: 99900277/81-01	INSPECTION DATE(S): 9/28-10/2/81	INSPECTION ON-SITE HOURS: 31

CORRESPONDENCE ADDRESS: The Rockbestos Company
ATTN: Mr. E. S. Reed
Vice President and General Manager
195 Church Street
New Haven, CT 06510

ORGANIZATION CONTACT: Mr. G. G. Littlehales, Quality Assurance Manager
TELEPHONE: (203) 772-2250

PRINCIPAL PRODUCT: Electrical Wire and Cable

NUCLEAR INDUSTRY ACTIVITY: Fifty percent of production devoted to nuclear products used by the electrical utilities.

ASSIGNED INSPECTOR: -I. Barnes for L. B. Parker, Reactive Inspection Section (RIS) — Date: 11-19-81

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes, I. Barnes, Chief RIS — Date: 11-19-81

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and 10 CFR Part 21.

B. SCOPE: This inspection was made as a result of: (1) the issuance of a 10 CFR Part 21 report by General Atomic Company concerning failures of Rockbestos RSS-6-104 coaxial cable during a steam line break test at 421°F and in oven testing of coils at 355°F while energized at 875V; and (2) a potential 10 CFR Part 50.55(e) report by Kansas Gas and Electric Company regarding nonconformance to specification requirements of Rockbestos cable delivered to Wolf Creek Generating Station, Unit 1 site. This inspection also covered the following areas: previously identified items; implementation of 10 CFR Part 21; and limited inspection of nonconforming materials, parts, or components and corrective action.

A. VIOLATION:

Contrary to paragraph 21.6 of 10 CFR Part 21, the required posting of 10 CFR Part 21, Section 206 of the Energy Reorganization Act of 1974 and adopted procedures, or Section 206 and the permissible alternate notice, had not been accomplished in the 195 Church Street offices.

B. NONCONFORMANCE:

Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Appendix D, paragraph 2 of Tennessee Valley Authority contract 80KS-825730 (STRIDE), Nonconformance Report, Form TVA 10548 had not been used to report RSS-6-100 series coaxial cable nonconformances with disposition "use as is" or "repair to other than original specifications."

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Unresolved Item (80-01): Qualification testing for cable insulation rework had not been performed for Grand Gulf site.

   Data was reviewed showing that the testing had been performed; however, the data had not been submitted to Bechtel. It was verified subsequent to the inspection that the formal report had been submitted to Bechtel on October 8, 1981.

2. (Closed) Follow-up Item (80-01): Assess the effectiveness of controls of the jacketing and rework (insulation and brazing) operations.

   No brazing is permitted on nuclear cable. All rework personnel have been certified through either the New Haven or the East Grandby Training Program. Nuclear cable can only be reworked when permitted by the purchaser. Insulation rework is tracable to a single conductor within a multi-conductor reel. Procedures for insulation rework were on the floor available to the rework personnel.

3. (Closed) Follow-up Item (80-01): Evaluation of the status of qualification testing related to insulation rework.

   San Onofre Qualification Testing was completed and accepted by Bechtel.

E. OTHER FINDINGS OR COMMENTS:

1. Regional Requests

   a. A 10 CFR Part 21 report by General Atomic Company reported failure of Rockbestos RSS-6-104 coaxial cable during steam line break test at 421°F and oven testing in coils at 355°F while energized at 875V. The failure, an electrical short between the inner conductor

and the braid, was caused by dielectric expansion and braid shrinkage which brought about kinks in the inner conductor. Rockbestos has redesigned the RSS-6-100 series cable mechanically and are performing qualification testing. They have contacted all purchasers of the cable and are replacing cable which could encounter adverse conditions. (See B. above)

b. Kansas Gas and Electric Company reported that Rockestos control cable had failed tensile strength and elongation tests. The nonconforming cable had been shipped to the Wolf Creek site with acceptable certified test reports. The cable had not been identified as nonconforming during manufacturing; therefore, no Off Standard Reports (OSRs) or Bechtel Supplier Deviation Disposition Requests (SDDRs) were written to disposition the cable. To correct these deficiencies Rockbestos has: (1) written OSRs and SDDRs covering these specific deficiencies; (2) tested samples of the defective cable with acceptable results from all the tests; (3) evaluated the deficiency for 10 CFR Part 21 implications and determined that the cable could perform its safety-related function in spite of this deficiency; and (4) instructed personnel responsible for initiating OSRs and SDDRs to issue them for nonconforming wire and cable.

2. Implementation of 10 CFR Part 21

Reviewed quality procedures No. Q-27, Procedure For Reporting And Evaluating Deviations From Technical Requirements Which Could Create a Substantial Safety Hazard in Nuclear Safety Related Cable, dated December 8, 1977, to verify that procedures had been adopted. Observed posting at Nicoll Street and Church Street locations. Posting in accordance with 10 CFR Part 21 was accomplished at Nicoll Street. (See A. above)

3. Follow-up Items

a. Rockbestos reported a potential 10 CFR Part 21 condition to NRC Region I as a result of being advised by Stone and Webster that Shoreham Nuclear Power Station had received cable with indentations in the conductor insulation. These indentations have been caused by a spirally wrapped binder thread. This problem is presently under investigation by Rockbestos and will be evaluated during a future inspection.

b. An evaluation of the original qualification testing of the RSS-6-100 series coaxial cable will be performed on a future inspection in order to determine the reasons for the disparity in results between the General Atomic Company and Rockbestos testing.

ORGANIZATION: ROCKWELL INTERNATIONAL - FLOW CONTROL DIVISION
RALEIGH, NORTH CAROLINA

REPORT NO.: 99900058/81-02	INSPECTION DATE(S): 7/21-24/81 8/10-14/81	INSPECTION ON-SITE HOURS: 69

CORRESPONDENCE ADDRESS: Rockwell International
Flow Control Division
Attn: Mr. J. V. Grasso -
General Plant Manager
1700 South Sanders St.
Raleigh, North Carolina 27603

ORGANIZATION CONTACT: Mr. R. A. Bandukwala
TELEPHONE: (919) 832-0525

PRINCIPAL PRODUCT: ASME Section III "N" Stamped Class 1, 2, and 3 Valves

NUCLEAR INDUSTRY ACTIVITY: Rockwell International - Flow Control Division's contribution to the nuclear industry represents approximately 10 percent of its total workload.

ASSIGNED INSPECTOR: Wm. D. Kelley 10/22/81
Wm. D. Kelley, Reactive Inspection Section (RIS) Date

OTHER INSPECTOR(S): H. L. Whitener, Reactor Inspector, Region II

APPROVED BY: I. Barnes 10/23/81
I. Barnes, Chief, RIS Date

INSPECTION BASES AND SCOPE:

A. BASIS: 10 CFR Part 21 and 10 CFR Part 50, Appendix B

B. SCOPE: This inspection was made as a result of: (1) the issuance of a licensee event report by the Carolina Power and Light Company concerning a stem to stem disc separation in a main steam isolation valve installed at the Brunswick Steam Electric Station, Unit 2; and (2) the issuance of a licensee event report by the Georgia Power Company concerning a stem to stem disc separation in a main steam stop valve installed at the E. I. Hatch Nuclear Plant, Unit 2. Additional areas included in the inspection included manufacturing process control, calibration, and records.

A. VIOLATIONS

None

B. NONCONFORMANCES

Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Rockwell International Flow Control Division (RI-FCD) drawings C-410354 and D-408177, dimensional measurements of two spare stem discs and four spare stems, that had been furnished by RI-FCD to Carolina Power and Light Company (CP&L) Brunswick Steam Electric Station, showed that the female threads of both disc were oversized and that the male threads of three of the stems were undersized with respect to Class 3 requirements.

C. UNRESOLVED ITEM

CP&L Purchase Order No. 716707, dated September 4, 1980, for spare stems, stem discs, piston assemblies and discs for the Brunswick Steam Electric Station main steam isolation valves (24" x 20" x 24" Fig. 1612 JMMNY), states they are to be manufactured in accordance with a quality assurance program which conforms to the applicable requirements of Appendix B to 10 CFR Part 50. RI-FCD stated they had taken an exception to this requirement in their proposal; however a copy of the exception to the requirement of Appendix B was not available at the Raleigh plant. The inspector was informed a copy of the exception would be requested from the RI-FCD area sales office and made available to the inspector on a subsequent inspection.

D. OTHER FINDINGS OR COMMENTS

1. Inspection of Main Steam Isolation Valves at CP&L, Brunswick Steam Electric Station, South Port N. C., on July 21-24, 1981

   a. There have been six main steam isolation valve failures, one in Unit 1 and five in Unit 2: (1) three of the failures were stem to stem disc separations; and (2) three of the failures were piston assembly to main disc separations.

   b. It was CP&L's understanding that all main steam isolation valves had been disassembled by construction craftsmen during plant test and startup because of excessive seat leakage. No documentation of the disassembly, repair, and reassembly was available to the inspector during the inspection. The follow-up review of this documentation will be performed by NRC-IE-RII on a subsequent inspection.

   c. The original valve design required: (1) the stem to stem disc connection to be preloaded with a torque of 1000 foot-pound; (2) a single round antirotation pin to be installed and captured with a plug weld; and (3) the piston assembly to main disc to be assembled with no specified preload and a single round antirotation pin installed and captured with a plug weld.

d. The removal of the antirotation pins for maintenance by drilling became a problem and RI-FCD recommended the use of square pins with an interference fit be used to prevent rotation during the drilling operation.

e. History of valve failures:

Failure	Unit	Valve Tag No.	Date	Event	Discussion
1	2	2-B21-F022D	7/3/76	Dropped Disc	Main disc to piston assembly separated; and antirotation pin not installed deep enough into disc.
2	2	2-B21-F022A	1/29/79	Dropped Disc	Stem to stem disc separated and the antirotation pin sheared; and piston assembly-main disc pin deformed.
3	2	2-B21-F028C	1/15/81	Dropped Disc	Main disc to piston assembly separated; and no evidence that an antirotation pin had been installed.
4	1	1-B21-F022C	3/30/81	Dropped Disc	Stem to stem disc separated; pin not recovered; and evidence of plug weld and hole damage indicates an antirotation pin had been installed.
5	2	2-B21-F022C	7/81	Dropped Disc	Stem to stem disc separated; stem antirotation pin hole clean; and stem threads damaged 180^{o} from stem pin hole.
6	2	2-B21-F022D	7/81	Dropped Disc	Main disc to piston assembly separated; no crest left on either male or female threads; pin fell out and not recovered; and plug weld did not fuse end of antirotation pin.

f. The two spare discs and four spare stems were inspected and one nonconformance identified.

g. Repair of Valves 2-B21-F028C and -F022D

The two spare stem discs with oversized female threads were returned to the RI-FCD Raleigh plant and two new stems made to fit. The stems and stem discs were returned to the Brunswick Steam Electric Station and CP&L proposed that: (1) the stem to stem disc connection be pinned with three 3/8 inch diameter antirotation pins of increased length; and (2) the piston assembly to main disc connection be pinned with two 1/2 inch diameter antirotation pins of increased length. RI-FCD concurred with the proposed modification and the spare parts were assembled and installed in the valves by CP&L personnel with RI-FCD representatives present in accordance with an approved CP&L maintenance instruction. The assembly of the spare parts was witnessed by the NRC inspector.

The stems, stem discs, piston assemblies, and main discs removed from the valves were shipped to the CP&L Shearon Harris Energy and Environmental Center for evaluation.

2. Inspection of Valve Internals at the CP&L Shearon Harris Energy and Environmental Center, New Hill, N. C., on August 11, 1981

The NRC inspector visually examined the failed stems, stem discs, piston assemblies and main discs that had been removed from the main steam isolation valves (2-B21-F022C & 2-B21-F022D). The stem to stem disc connections had been sectioned and thread wear was clearly discernible.

3. Inspection at the RI-FCD Plant, Raleigh, N. C., on August 10-14, 1981

a. Presentation of RI-FCD Technical Report

The NRC inspector met with RI-FCD personnel and discussed their Technical Report entitled, "MSIV Stem-Disc and Disc-Piston Disassemblies During Plant Operation." The NRC inspector was unable to determine from review of the contents of this report that either a determination had been made of the specific reasons for the valve failures, or that necessary actions to preclude recurrence of future failures had been established.

b. Calibration

The NRC inspector reviewed the calibration records for the gages, wires, and micrometers which had been used to measure the threads of the spare parts supplied to CP&L, in order to verify that their calibration was current during the period in which the parts were manufactured.

c. Records

The NRC inspector reviewed the records (certified mill test reports and nondestructive test reports) for valves 2-B21-F022C and 2-B21-F022D and the CP&L purchase documents for the spare stems and stem disc. One unresolved item was identified.

d. Manufacturing Process Control

The NRC inspector reviewed the shop travelers for valves 2-B21-F022C and 2-B21-F022D and the CP&L purchased spare parts and verified that the applicable documents had been referenced, inspection points established, and that the dimensional inspection had been signed off by a RI-FCD inspector.

e. Item Requiring Follow-Up Inspection

Review of the design utilized to prevent disassembly of the stem disc from the stem and the main disc from the piston assembly indicates that the antirotation pins can potentially be insufficiently inserted to perform the required locking function. The process controls used to assure proper assembly, pin insertion, and plug welding were not reviewed, however, during this inspection. This subject will be further reviewed during a future inspection.

ORGANIZATION: SIEMENS-ALLIS, INCORPORATED
NORWOOD, OHIO

REPORT NO.: 99900758/81-01	INSPECTION DATE(S): 9/14-18/81	INSPECTION ON-SITE HOURS: 32

CORRESPONDENCE ADDRESS: Siemens-Allis, Incorporated
Medium Motor Division
ATTN: Mr. R. F. Gilton
Quality Assurance Manager
4620 Forest Ave.
Norwood, Ohio 45212

ORGANIZATION CONTACT: Mr. R. F. Gilton, Quality Assurance Manager
TELEPHONE: (513) 841-3413

PRINCIPAL PRODUCT: Class 1E Electric Induction Motors (75 to 10,000 HP).

NUCLEAR INDUSTRY ACTIVITY: Commercial nuclear production of Siemens-Allis, Incorporated, Norwood, Ohio Plant totals one percent of total company production. Fifteen nuclear contracts are presently in-house for current and future production.

ASSIGNED INSPECTOR: Uldis Potapovs for J. W. Sutton, Components Section (CS) — Date: 11/5/81

OTHER INSPECTOR(S):

APPROVED BY: Uldis Potapovs — U. Potapovs, Acting Chief, CS — Date: 11/5/81

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B, and 10 CFR Part 21.

B. SCOPE: Management meeting, 10 CFR Part 21 inspection, change control, nonconformance/corrective action, manufacturing process control, and review of vendor activities.

ORGANIZATION: SIEMENS-ALLIS, INCORPORATED
NORWOOD, OHIO

REPORT NO.: 99900758/81-01	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCES:

Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Siemens-Allis QA Manual Section N10.00, eight nonconforming items identified on report 5352 were continued through the manufacturing process without being dispositioned as required by QA procedures.

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS:

1. 10 CFR Part 21 - The inspector reviewed the Siemens-Allis Medium Motor Generator Division policy on reporting of 10 CFR Part 21 items.

   The inspector reviewed the procedure to be used to report under 10 CFR Part 21 and checked those areas in which the procedure had been posted.

   The Log Book used for recording Part 21 evaluations was reviewed. No defects have been reported by Siemens-Allis, Inc. The inspector determined that the requirements of reporting and posting under 10 CFR Part 21 have been complied with as required by regulations.

2. Change Control - The inspector reviewed the Siemens-Allis, Inc., Quality Assurance procedures to determine how changes to documents are controlled. Reviewed various change notices to shop orders to determine adherence to the QA Manual requirements. Relative to the documents examined, the inspector found that the QA program commitments were in conformance with the QA program requirements and were being implemented as required.

3. Nonconformance and Corrective Action - The inspector reviewed QA Manual Sections 5.01 and N10.00 to determine how nonconforming items are handled. The system required for identifying and controlling nonconforming items and the corrective action taken to prevent recurrence was examined for implementation.

   The computer run of nonconforming items was examined. Segregation areas designated for storage of nonconforming items were inspected.

   During the inspector's review of ten Quality Problem Reports (QPRs), the inspector identified a QPR, No. 5352, consisting of eight items that had not been reviewed and processed as required by the QA procedures.

Work on these items was allowed to proceed in the manufacturing process without the required review by the Review Board and sign off by required personnel.

One nonconformance was identified (see paragraph B.).

4. Manufacturing Process Control - The QA Manual Sections N2.01, N5.01, N6.01, N12.01, and related procedures were reviewed to determine if the systems and procedures established for the manufacture of electric motors are in compliance with codes, specifications, and regulatory requirements.

   Review of related documents, specifications, engineering reviews, shop orders and in-process sheets verified conformance with the program requirements.

ORGANIZATION: STONE & WEBSTER ENGINEERING CORPORATION
BOSTON, MASSACHUSETTS

REPORT NO.: 99900509/81-03	INSPECTION DATE(S): 8/31-9/4/81	INSPECTION ON-SITE HOURS: 93

CORRESPONDENCE ADDRESS: Stone & Webster Engineering Corporation
ATTN: Mr. R. B. Kelly
Vice President Quality Assurance
Post Office Box 2325
Boston, MA 02107

ORGANIZATION CONTACT: Mr. F. B. Baldwin, Assistant QA Manager
TELEPHONE: (617) 973-6566

PRINCIPAL PRODUCT: Architect Engineering Services

NUCLEAR INDUSTRY ACTIVITY: Major projects under construction include design and construction contracts for Beaver Valley 2, River Bend 1, Shoreham, Nine Mile Point 2 and Millstone 3, design contract for North Anna 3 and construction contract for Clinch River. Major projects not yet under construction, but under contract include River Bend 2, New Haven 1 and 2, Montague 1 and 2 and Jamesport 1 and 2. In addition, there are 44 modifications/repair/service contracts. The aforementioned contracts cover work performed in the Boston, Cherry Hill, New York, and Denver offices. However, all of these contracts are controlled out of the Boston office.

ASSIGNED INSPECTOR: J. R. Costello
J. R. Costello, Reactor Systems Section (RSS) — Date 10/13/81

OTHER INSPECTOR(S): D. G. Breaux
D. D. Chamberlain

APPROVED BY: C. J. Hale
C. J. Hale, Chief, RSS — Date 10-21-81

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B, and Topical Report SWSQAP 1-74A.

B. SCOPE: Design process management, evaluation of supplier performance, verification activities, audits, follow up on a regional request concerning main transformer failures at North Anna Unit 2, and status of previous inspection findings.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

It is not always apparent that the ANSI N45.2.12 requirements and the Stone & Webster (S&W) procedural requirements for holding a post-audit conference and identifying persons contacted during the post-audit conference are being followed.

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Follow-up Item (80-06): Further review of a terminated employee's work was to be conducted by S&W.

   All work of the terminated employee (employee's whose education and employment records had been falsified or could not be verified) was reviewed and either certified or corrected by qualified S&W personnel.

2. (Closed) Follow-up Item (80-06): Procedures EAP 16.1 and QS 16.1 were revised as a result of the 79-03 inspection. However, the potential for inadequate documentation may exist in the present revised procedures when a "Report of a Problem" is returned to the originator by the Project Engineer or Engineering Assurance.

   S&W is maintaining a record of all "Reports of a Problem" including those returned to the originator by the Project Engineer or Engineering Assurance. The inspector examined a sample of reports returned to the originator and verified that adequate documentation exists to support the decisions taken.

E. OTHER FINDINGS OR COMMENTS:

1. Audits - Topical Report SWSQAP 1-74A and applicable S&W procedures were examined to determine quality assurance program commitments. To verify implementation of these commitments the following documents were examined: three audit schedules; 18 audit reports covering Engineering Assurance, Quality Assurance Cost & Auditing and Procurement Quality Assurance Audits; 24 audit plans; and nine qualification and certification records. Relative to the documents examined, one unresolved item was identified (See Item C above). No nonconformances or follow-up items were identified. The unresolved item resulted from one identified case (EA Audit No. 35) where the date of the audit and the post-audit conference was not specified and from the practice of the Quality Assurance Cost and Auditing Division not listing post-audit attendees in their reports.

2. Design Process Management - The S&W Topical Report and related engineering assurance procedures were examined to determine program commitments. The following documents were examined to verify implementation of the commitments: Beaver Valley Power Station Unit 2 PSAR Section 8 relating to the emergency diesel generator, Millstone Unit 3 PSAR Section 9.2.2.1 relating to the component cooling water system, 12 S&W design drawings, two vendor drawings, four design calculations, three specifications, and one system description.

   The NRC inspector found that the program commitments were implemented. However, a discrepancy was identified on the Millstone Unit 3 project relating to an instrument set point calculation for the component cooling water system. A new calculation was made which changed instrument set points and approximately two months later a bid specification was issued which used the set point values from the old calculation. The NRC inspector was informed that a system was being developed whereby all instruments with set points would have an associated calculation. The calculation examined was a "trial" calculation for this new system. The instrument set point calculation system for the Millstone Unit 3 project will be examined further during a future inspection.

3. Main Transformer Failure at North Anna Unit 2 - Four main transformer failures have occurred at North Anna Unit 2 (NA-2) over the past year. One transformer failure resulted in a fire from a casing rupture and the subsequent oil spillage. The fire damaged cable from a reserve station service transformer which caused a momentary loss of power to the emergency buses. This momentary loss of power apparently caused a safety injection signal due to spurious bistable trips in the reactor protection system. The purpose of the NRC inspection of this area at S&W was to evaluate the generic safety implications of the transformer failures relative to S&W activities. The NRC inspector found the following from examination of documents and conversations with personnel at S&W:

   a. The main transformers at NA-2 are not Class IE.

   b. S&W did not specify or procure the main transformers for NA-2.

   c. The main transformers that failed at NA-2 were apparently supplied directly to Virginia Electric Power Company (VEPCO) from the Westinghouse Large Power Transformer Facility in Munice, Indiana.

   d. S&W has one open order (non-class IE) with the Westinghouse Large Power Transformer Facility.

e. S&W has never had the need to categorize the Westinghouse Large Power Transformer Facility as a Category I or Class 1E supplier.

f. S&W does not specify oil filled Class IE transformers for their designed facilities.

g. The inverters providing power to the reactor protection system should be isolated from voltage fluctuations on the emergency buses by the DC battery supply; however, VEPCO has requested S&W to evaluate the reason for the spurious reactor protection bistable trips that occurred during the main transformer fire event.

The NRC inspector concludes that the main transformer failures at NA-2 do not have any generic safety implications relative to S&W activities. However, a review will be made of the S&W evaluation of the spurious reactor trips during a future NRC inspection.

4. Evaluation of Supplier Performance - The related sections of the S&W Topical Report and the applicable Quality Assurance Department QA directives that were prepared, approved and issued were examined to assure they were consistent with commitments to the NRC. Ten purchase order files, five vendor history files, the latest Vendor Quality Rating list along with ten annual vendor reevaluation and five PQA evaluation group document review files were examined to determine if the committed program was being implemented. In this area of the inspection, the committed program was being implemented.

5. Verification Activities - The related sections of the S&W Topical Report and the applicable Quality Assurance Department QA directives were examined to assure that they were consistent with commitments to the NRC. Ten procurement specifications, along with their associated inspection plans, were reviewed to determine if the committed program was being implemented. Ten purchase order files were reviewed to assure that committed shop inspections, that were called out in the inspection plans, were done correctly. Five PQA evaluation group document review files were reviewed to assure that content reflected procedural commitments. In this area of the inspection, the committed program was being implemented.

ORGANIZATION: STONE & WEBSTER ENGINEERING CORPORATION
CHERRY HILL, NEW JERSEY

REPORT NO.: 99900509/81-04	INSPECTION DATE(S): 11/2-6/81	INSPECTION ON-SITE HOURS: 30

CORRESPONDENCE ADDRESS: Stone & Webster Engineering Corporation
ATTN: Mr. R. B. Kelley
Vice President Quality Assurance
Post Office Box 2325
Boston, MA 02107

ORGANIZATION CONTACT: Mr. F. B. Baldwin, Assistant QA Manager
TELEPHONE: (617) 973-6566

PRINCIPAL PRODUCT: Architect Engineering Services

NUCLEAR INDUSTRY ACTIVITY: Major design and construction contracts include Beaver Valley 2, River Bend 1, Shoreham, Nine Mile Point 2 and Millstone 3; design contract for North Anna 3 and construction contract for Clinch River. In addition, there are 44 modifications/repair/service contracts. The aforementioned contracts cover work performed in the Boston, Cherry Hill, New York, and Denver offices. The River Bend and Nine Mile Point contracts are conducted in the Cherry Hill office; however, all contracts are controlled by the Boston office.

ASSIGNED INSPECTOR: C J Hale for — 12-16-81
D. D. Chamberlain, Reactor Systems Section (RSS) — Date

OTHER INSPECTOR(S):

APPROVED BY: C J Hale — 12-16-81
C. J. Hale, Chief, RSS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B, and Topical Report SWSQAP 1-74A.

B. SCOPE: Training, status of previous inspection findings, and follow up on a request relating to Stone & Webster (S&W) methods for evaluation of personnel qualifications and assignment of personnel.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and procedure RBP 6.2.-0 Sections 2.3.3 and 2.5.2, the Action Complete column of the Problem Report Log for Problem Report PR-P-114 was completed prior to all action being completed and the River Bend Project Problem Report Coordinator did not issue an IOC (inter office correspondence) to the cognizant Lead Engineers every 2 months for other overdue Action Complete Problem Reports.

2. Contrary to Criterion V of Appendix B to 10 CFR part 50 and Engineering Department Policy and Procedure No. 3.3.4, Experience Records for approximately 50% of the 30 personnel records examined were not updated on an annual basis.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Follow Up Item (81-02): Format and revision review discrepancies on some River Bend (RB) project structural design calculations.

   S&W has initiated a plan for the review and upgrade to present procedure requirements for all RB structural design calculations. This effort is now scheduled for completion by June 1, 1982. From the calculations examined, it appears that the implementation of the review plan is effectively resolving the format and revision review discrepancies.

2. (Closed) Follow Up Item (81-02): Specifications are not being amended and reissued within required time frame.

   The Nine Mile Point project has initiated a new tracking and notification system for required revision of specifications that is effectively controlling the timely revision of specifications. The River Bend project is bringing all specification revisions up to date and the tracking system now used should effectively identify specifications that are due for revision.

3. (Closed) Follow Up Item (81-02): Closing of problem reports before all necessary actions are completed.

   Further inspection in this area resulted in an item of nonconformance (see B.1 above). During this inspection, the following action was taken relative to the nonconformance identified:

   a. The required action for Problem Report PR-P-114 was completed.

   b. The required IOCs were issued to the cognizant Lead Engineers.

   c. Project Procedure RBP 6.2-0 was revised to clearly define what the Problem Report Coordinator must receive and accomplish prior to completing the action complete column of the Problem Report Log.

   No further written response to nonconformance B.1 above is required.

E. OTHER FINDINGS OR COMMENTS:

1. Training - Topical Report SWSQAP 1-74A and applicable S&W procedures were examined to determine quality assurance program commitments. The training records for 30 personnel were examined to verify implementation of the program commitments. Within the scope of this inspection, the QA program commitments were being implemented.

   It was noted that S&W revised the Quality Standard (QS-2.12) for Qualification, Certification, Indoctrination and Continuing Education of Personnel on October 21, 1981, in order to formalize the training requirements for all S&W personnel. The revised QS is now being implemented and should provide an enhanced awareness of training needs and requirements.

2. Stone & Webster Method of Evaluation of Personnel Qualifications and Assignments of Personnel - The purpose of this area of inspection was to verify that adequate and current information is available to supervisory personnel for proper assignment of personnel. Topical Report SWSQAP 1-74A and applicable procedures were to examined to determine Quality Assurance Program commitments. The available education and experience records for 30 personnel were examined to verify implementation of the program commitments. A procedural nonconformance was identified in the area of Experience Records (see B.2 above). The Experience Records are used by supervision as a basis for promotions, transfers, and personnel assignments. Although

some Experience Records were not being updated as required, all management personnel interviewed were knowledgeable of the personnel and their qualifications for the personnel records that were examined. The NRC inspector concluded that Experience Records that are maintained current, provide adequate information to supervision for assignment of personnel.

ORGANIZATION: STRUTHERS-DUNN, INCORPORATED
PITMAN, NEW JERSEY

REPORT NO.: 99900380/81-01	INSPECTION DATE(S): 8/10-14/81	INSPECTION ON-SITE HOURS: 24

CORRESPONDENCE ADDRESS: Struthers-Dunn, Incorporated
ATTN: Mr. J. L. Pfeffer, President
Lambs Road
Pitman, New Jersey 08071

ORGANIZATION CONTACT: Mr. J. Jordan, Director, QA
TELEPHONE: (609) 589-7500

PRINCIPAL PRODUCT: Relays, contactors and motor starters

NUCLEAR INDUSTRY ACTIVITY: Approximately 1% of total production.

ASSIGNED INSPECTOR: J. W. Sutton
J. W. Sutton, Components Section, CS — 9-25-81 Date

OTHER INSPECTOR(S):

APPROVED BY: U. Potapovs
U. Potapovs, Acting Section Chief, CS — 9-25-81 Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B, and other NRC requirements.

B. SCOPE: Management meeting, previous inspection findings, change control, nonconformance and corrective action, Part 21 inspection, and review of vendor's activities.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Violation (79-01): Procedures had not been established for implementation of requirements of 10 CFR Part 21 invoked by Stone and Webster, PO No. ZBV-739, dated August 15, 1979.

   The inspector verified that the vendor had established and posted, as required by 10 CFR Part 21 requirements, procedures for reporting a Part 21 defect. The final procedure titled, "Recording and Reporting Defects on Nuclear Related Relays/Components," dated February 1, 1980, was reviewed for content and requirements. The procedure meets Part 21 reporting requirements.

2. (Closed) Deviation (Item A, 79-01): Acceptable certificates of compliance were not acceptance-stamped and dated by the inspector.

   The inspector reviewed documentation issued by the vendor which reinstructed QC and material inspectors to stamp certificate of compliance as required by procedures.

3. (Closed) Deviation (Item B, 79-01): Audits were not performed and completed per the minimal audit schedule.

   The inspector verified that the audit schedules for 1980-81 had been prepared and that audits had been performed as required.

4. (Closed) Deviation (Item C, 79-01): Results of QC checks of gages at quarterly audits were not being recorded and dated on gage cards.

   The inspector verified by review of 13 inspection gage cards that quarterly audits being performed by QC inspectors are being recorded and stamped. Quarterly audits from November 11, 1979 to August 12, 1981, had been performed.

5. (Closed) Deviation (Item D-79-01): Material Review Board procedure not addressed in the Amendment attached to the QC Manual as required by 10 CFR Part 50, Appendix B, related purchase orders.

   The inspector verified by review of letters, in-house memos, and a QA Manual revision to Section 8, that amendments are to be attached to the QC Manual.

6. (Closed) Unresolved Item (Paragraph C.3.b.(1)); No indication that a QA representative had reviewed purchase orders and additional changes.

   The inspector reviewed Purchase Orders Nos. 16856-16857, and 16858 to determine if QA had reviewed the documents as required by the procedures. The documents reviewed indicated approval by a QA representative.

7. (Closed) Unresolved Item (paragraph c.3.b.(2)): Precision gage records displayed QC Acceptance Stamps which had been inconsistently dated.

   The inspector verified by review of the inspection gage record cards that the current dates are consistent with the audit schedules.

8. (Closed) Unresolved Item C.3.b(3): Corrective Action Forms, logs, and follow up are not accomplished in a predictable fashion.

   The inspector verified that the vendor had issued a directive/procedure to control vendor activities. The nonconformance book has been changed to implement this activity for follow up of unacceptable materials.

9. (Closed) Unresolved Item (Paragraph D.3.b): The production copy of a changed shop order is the only copy stamped, as opposed to all copies.

   The inspector reviewed QA Procedure Section 1 dated December 19, 1979, paragraph G, that requires that only the production copy of the shop order is to be stamped. The inspector reviewed three change orders issued on the following shop orders, FC 70836, 36375, and FC 69530, for compliance to the revised procedure. The orders were found to be in order.

E. OTHER FINDINGS:

1. Management Meeting:

   The inspector relayed to the vendor during this meeting the changes that has occurred in the Vendor Inspection Program since the last inspection conducted on October 29-November 1, 1979. He also explained the revision to the White Book and VIB's new reporting format.

The vendor indicated that his total involvement in the commercial nuclear field was approximately 1%.

2. Change Control

The inspector reviewed the Struthers-Dunn, Inc. (SDI) QA Manual Sections 1, 2, 8, and 14, Revision 4, to determine how changes to documents are controlled. Reviewed various change notices to shop orders to determine adherence to the QA Manual requirements. Relative to the documents examined, the inspector found that the QA Program commitments were adequately implemented.

3. Nonconformance - Corrective Action

The inspector reviewed Sections 8 and 18 of the QA Manual to determine how nonconforming items are handled. A system for identifying and controlling nonconforming items and the corrective action taken was examined.

The controlling book containing all identified nonconforming items and vendor interoffice memos were reviewed for content.

Relative to the documents examined the inspector found that the QA Program commitments were being adequately implemented.

4. Implementation of 10 CFR Part 21

During the course of reviewing the corrective action taken by the vendor to correct the reported Notice of Violation (79-01) the inspector reviewed the vendor's final Procedure No. 338 dated February 1, 1980 pertaining to the recording and reporting of nuclear related relay/component problems.

The inspector also checked those areas in which the revised Part 21 procedure has been posted.

The inspector determined that the requirements of reporting and posting under 10 CFR Part 21 have been complied with as required by regulations.

ORGANIZATION: TECH-SIL, INC.
ELK GROVE VILLAGE, ILLINOIS

REPORT NO.: 99900753/81-01	INSPECTION DATE(S): 8/25-28/81	INSPECTION ON-SITE HOURS: 56

CORRESPONDENCE ADDRESS: TECH-SIL, Inc.
ATTN: Mr. L. Acerra
Manager, Quality Assurance
1800 Elmhurst Road
Elk Grove Village, Illinois 60007

ORGANIZATION CONTACT: Mr. L. Acerra
TELEPHONE: 312/364-4330

PRINCIPAL PRODUCT: Penetration Seals

NUCLEAR INDUSTRY ACTIVITY: TECH-SIL, Inc., (TSI) is currently providing materials, equipment, engineering and design technology, and installation of fire and radiation seals for mechanical and electrical penetrations, either in total or in part, at four US nuclear power generating stations. Past work has been performed at seven US nuclear power generating stations. Approximately 98% of their work is devoted to the commercial nuclear industry.

ASSIGNED INSPECTOR: T. E. Ellershaw, Reactive Inspection Section (RIS) — Date: 10-13-81

OTHER INSPECTOR(S): L. Parker, RIS

APPROVED BY: I. Barnes, Chief, RIS — Date: 10-14-81

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B

B. SCOPE: This inspection was made as a result of penetration seal materials being provided to the LaSalle County Station and the William H. Zimmer Nuclear Power Station, with formulations different from that tested for fire resistance, and concerns expressed over the adequacy of qualification testing of flexible penetration boots that have been furnished to the Grand Gulf Nuclear Station, Unit 1. Additional areas selected for inspection included: material identification and control; procurement control; equipment calibration; and control of nonconformances and corrective actions.

ORGANIZATION: TECH-SIL, INC.
ELK GROVE VILLAGE, ILLINOIS

REPORT NO. 99900753/81-01	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

1. Contrary to paragraph 21.6 of 10 CFR Part 21, posting of 10 CFR Part 21 and Section 206 of the Energy Reorganization Act of 1974 or an appropriate notice had not been accomplished.

2. Contrary to paragraph 21.21(a) of 10 CFR Part 21, procedures had not been adopted to provide for: (a) evaluating deviations or informing the licensee or purchaser; and (b) assuring that a director or responsible officer was informed if the supplied basic component (1) failed to comply, or (2) contained a defect.

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50, QA Manual Section XVII, and Procedure QC-201.3, certain records did not furnish evidence of activities affecting quality, as shown by the following:

   The Systems and Test Log for the Hi Density (leaded) Elastomers using formula number TS-MS-0060E showed that 1631 lbs. of 170 Elastomer "A", lot number EPO 41861 were used on July 27 and 28, 1981, and 1048.5 lbs. of 170 Elastomer "B", lot number EPO 41880 were used on July 28 and 29, 1981.

   However, a review of Receiving Reports showed that TECH-SIL, Inc., had received just 1500 lbs. of 170 Elastomer "A", lot number EPO 41861, and 1000 lbs. of 170 Elastomer "B", lot number EPO 44880, both of which were on Receiving Report No. 364, dated July 1, 1981.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 3.0 of QA procedure 108 in the QA manual, the calibration of scales used in the formula mixing process could not be certified to a standard traceable to the National Bureau of Standards.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section XV of the QA manual, the actual disposition and subsequent verification of rejected material could not be determined, in that these activities are not documented.

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Penetration Seal Materials With Formulations Different From Those Tested For Fire Resistance - The penetrations at LaSalle County Station and William H. Zimmer Nuclear Power Station, in which this seal material was used, have been identified, with subsequent removal and replacement of the seal material. The balance of the seal material is accounted for and is identified and segregated at the Elk Grove Village facility.

2. Qualification Testing of Flexible Penetration Boots - TSI had qualified the penetration boots in regard to fire test requirements. However, due to concerns over the adequacy of the tests, TSI had additional tests performed on the High Density Silicone Gel/Flexible Boot combination. The boot and gel were irradiated for a 40-year equivalency, then fire tested and cycle tested. The fire and cycle tests were witnessed and approved by Portland Cement Association-Construction Technology Laboratories Division, with the test reports being updated April 29, 1981. The irradiation tests were performed by the University of Michigan Phoenix Memorial Laboratory.

3. Material Identification and Control - This area was evaluated by review of receiving reports, material test reports, mixing systems and test logs, and observation of stored materials which were identified by lot/batch numbers. Nonconformance A was identified.

4. Procurement Control - This area was evaluated by inspecting purchase orders, certificates of analysis, vendor assessment sheets, and material certifications. No deficiencies were observed, however, the chemical compositions of the purchased elastomers were not shown on the accompanying certificates of analysis.

5. Equipment Calibration - This area was evaluated by inspecting scale logs and calibration records. Nonconformance B was identified.

6. Control of Nonconformances and Corrective Actions - This area was evaluated by inspecting Nonconforming Condition Reports and Minor Variation Reports from several site operations and the formula mixing facility. Nonconformance C was identified.

ORGANIZATION: UNITED ENGINEERS AND CONSTRUCTORS, INC.
PHILADELPHIA, PENNSYLVANIA

REPORT NO.: 99900510/81-03	INSPECTION DATE(S): 9/14-18/81	INSPECTION ON-SITE HOURS: 62

CORRESPONDENCE ADDRESS: United Engineers and Constructors, Inc.
ATTN: Mr. R. A. Curnane, Vice President
Project Support Operations
30 South 17th Street
Philadelphia, PA 19101

ORGANIZATION CONTACT: Mr. J. B. Silverwood, QA Manager
TELEPHONE: (215) 422-4744

PRINCIPAL PRODUCT: Architect Engineering Services

NUCLEAR INDUSTRY ACTIVITY: United Engineers and Constructors (UE&C) is the Architect Engineer on the following major projects: Seabrook, Units 1 and 2, and Washington Public Power Supply System, Units 1 and 4 (WNP-1&4). Also, UE&C has active engineering service contracts on two nuclear plants for two utility clients.

ASSIGNED INSPECTOR: C. J. Hale /for — 9-30-81
D. D. Chamberlain, Reactor Systems Section(RSS) — Date

OTHER INSPECTOR(S): D. G. Breaux, RSS

APPROVED BY: C. J. Hale — 9-30-81
C. J. Hale, Chief, RSS — Date

INSPECTION BASES AND SCOPE:

A. BASES: The PSAR for the Seabrook, Unit 1 & 2, Project, the PSAR for the Washington Public Power Supply System, Unit 1 (WNP-1), Project, and 10 CFR Part 50, Appendix B.

B. SCOPE: Design change control, verification activities, product acceptance, and status of previous inspection findings.

ORGANIZATION: UNITED ENGINEERS AND CONSTRUCTORS, INC.
PHILADELPHIA, PENNSYLVANIA

REPORT NO.: 99900510/81-03	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to ANSI N45.2.9., Section IV.E.1.b., and Appendix A of Quality Assurance Procedure QA-17 and Section IV.A.4. of Quality Assurance Procedure QA-18, all QA records for the Seabrook Project are not being stored and/or adequately protected from damage or deterioration and audits of record storage areas are not being performed on a periodic basis.

2. Contrary to Section 17.2.2.2., of the WNP-1 project PSAR, design changes are not being subjected to the same design control measures as the original design. A project change proposal was revised and approved without receiving the same review as the original issue.

3. Contrary to Sections 17.2.7. and 17.2.10. of the Seabrook Project PSAR, fabrication of feedwater isolation valves by Borg Warner NVD (contract 248-36) proceeded past the first mandatory hold point designated on the Vendor Surveillance Check Plan without a UE&C vendor surveillance representative's witness of the inspection or test, or written consent by UE&C to waive this hold point.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Unresolved Item (81-02): The long term storage area for hard copy QA records on the Seabrook Project does not appear to meet the requirements of ANSI N45.2.9.

   Further examination of the QA record system resulted in an item of nonconformance (see B.1. above).

2. (Closed) Unresolved Item (81-02): WNP-1 Project Procedure No. 41 (PP-41) for Change Management does not appear to represent present practices.

   Ten Project Change Proposals (PCPs) were examined and Revision 0 of PP-41 to determine if the present requirements were adequate and were being implemented. This examination resulted in an item of nonconformance (see B.2. above). UE&C management stated that an "interim change to PP-41" will be issued "no later than October 9, 1981." This area will be examined further during a future inspection to determine if the revised procedure represents present practices.

ORGANIZATION: UNITED ENGINEERS AND CONSTRUCTORS, INC.
PHILADELPHIA, PENNSYLVANIA

REPORT NO.: 99900510/81-03	INSPECTION RESULTS:	PAGE 3 of 3

3. OTHER FINDINGS OR COMMENTS:

1. Design Change Control - Section 17.2. of the WNP-1 and Seabrook Projects PSARs and applicable procedures were examined to determine UE&C program commitments. In order to verify implementation of the program commitments, 15 revised design drawings and 25 design change documents were examined. From the documents examined, the program commitments were implemented except as noted in B.2. and D.2. above.

2. Verification Activities - The related sections of the UE&C Seabrook Project PSAR and applicable Quality Assurance procedures were examined to determine if procedures were prepared, approved and issued to prescribe a controlled system for management of verification activities that are consistent with commitments to the NRC. In addition, ten vendor surveillance check plans and their related shop inspection reports, ten procurement specifications, five UE&C QA vendor audits, and five Vendor Surveillance personnel NDE certification files were examined to determine if the committed program was being effectively implemented. The committed program was being implemented with the exception of nonconformance B.3. above.

3. Product Acceptance - The related sections of the UE&C Seabrook Project PSAR and applicable quality assurance procedures were examined to determine if procedures were prepared, approved and issued to prescribe a controlled system that is consistent with commitments to the NRC. In addition, ten vendor surveillance files, ten final shop inspection reports, eight Quality Shipment Releases, ten Vendor Surveillance Check Plans and five UE&C QA vendor audits were examined to determine if the committed program was being implemented. Within the area of inspection no nonconformance or unresolved items were identified.

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
ELECTRO-MECHANICAL DIVISION
CHESWICK, PENNSYLVANIA

REPORT NO.: 99900033/81-02	INSPECTION DATE(S): 9/21-25/81	INSPECTION ON-SITE HOURS: 60

CORRESPONDENCE ADDRESS: Westinghouse Electric Corporation
Electro-Mechanical Division
ATTN: Mr. F. R. Bakos
General Manager
Cheswick Avenue
Cheswick, PA 15204

ORGANIZATION CONTACT: Mr. C. E. Owens, Product Assurance Manager
TELEPHONE: (413) 363-8700

PRINCIPAL PRODUCT: Pumps, Control Rod Drives, and Valves

NUCLEAR INDUSTRY ACTIVITY: About 55% of the sales is nuclear.

ASSIGNED INSPECTOR: W. M. McNeill — 12/8/81
W. M. McNeill, Components Section (CS) — Date

OTHER INSPECTOR(S): W. D. Kelley, Reactive Inspection Section (RIS)

APPROVED BY: — 12/8/81
U. Potapovs, Acting Chief, CS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR 21 and Westinghouse Topical Report WCAP-8370, Revision 9A.

B. SCOPE: This inspection was made as a result of the issuance of 10 CFR Part 50.55(e) reports by Florida Power and Light Company (St. Lucie, Unit 2) and SNUPPS (Wolf Creek and Callaway, Units 1 and 2) concerning an identified potential failure of 3-inch thru 18-inch gate valves to close under flow conditions at maximum pressure differential. QA programmatic areas included in the inspection were audits, nonconformances and corrective actions, calibration, design input, design verification, and design document control.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to the Water Reactor Divisions Policy/Procedure Manual, Section 18.0, paragraph C and Section 5 of the Topical Report, internal audit procedures did not require preaudit and postaudit conferences.

2. Contrary to Procedure EIM-26, paragraph 8 and Section 5 of the Topical Report, nonconforming parts were not being properly identified, in that a part was found with an incorrect Material Review Report (MRR) referenced.

3. Contrary to Procedure EIM-23, paragraph III.7 and Section 5 of the Topical Report, there was no evidence of QA approval of the deletion of an inspection step.

4. Contrary to Procedure EIM-41, paragraph 3.2 and Section 5 of the Topical Report, a plug gage was accepted, even though it was outside the specified calibration band.

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS:

1. Audits - The three internal audits performed this year were reviewed in detail. The independence of the team and their qualifications were inspected. The qualification records of the lead auditor and three auditors were inspected. The use of checklists and the reporting of findings were verified. The corrective action and follow up of corrective action were verified on four findings and observations. The Nuclear Energy System annual management audit was also reviewed. In this area, nonconformance No. 1 was identified.

2. Nonconformance and Corrective Actions - Nine MRRs and four Error Correction Tags (ECTs) were reviewed of hardware found inprocess. The review, approval, and disposition of each were verified. In the area of identification of nonconforming hardware, nonconformance No. 2 was identitied. The MRR in question identified a step on an inside diameter of the part which had been dispositioned accept-as-is. This step was not observed, and the part was remeasured. The measured diameter did not agree with the MRR. It was within tolerance. This part has been a member of a larger lot. The balance had been shipped to an outside plating shop. At the end of this inspection, Westinghouse

was attempting to find the part on MRR at the outside plating shop. The summarization and trend analysis of MRRs, ECTs, etc., were reviewed. The identification of a recent Licensee Event Report was traced through the Field Deficiency Report system including its evaluation. One data package for a recent shipment of valves was reviewed to verify inclusion of all Deviation Notices (DNs) and the DNs customer review and approval. In review of ECT 872951 nonconformance No. 3 was identified. ECT 872951 had been voided by manufacturing engineering by changing the work instructions. It appears the inspection was not necessary, however. there was no evidence of QA approval of the inspection deletion.

3. Calibration - A sample of 20 gages and instruments were inspected. The frequency, serialization, labeling, and inspection records were verified. The use of NBS traceable standards and acceptable transfer ratios were verified. The computer printouts of gage and instrument status were inspected. In this area, nonconformance No. 4 was identified. The gage in question had a calibration band of nominal $\pm$ .0004. The MRR accepted this gage as .0002 undersize. The gage had worn an additional .0002 and been accepted on April 18, 1980, and April 3, 1981, as is by the calibration inspectors.

4. Design Input - The inspector reviewed WCAP-8370 Quality Assurance Plan; design report for Westinghouse Class 1 Nuclear Valves; meeting minutes of the first, second, and third design review of the valves; and four layout drawings of gate and check valves to verify that the design input procedures were effectively implemented. One follow-up item concerning pressure build up in the bonnet with the gate valves in the closed position was identified. The Westinghouse EMD gate valve design permits a pressure rise in the bonnet if the valve is closed in the cold condition and the system start-up increases the valve temperature. Westinghouse EMD stated this had been evaluated and would present their evaluation to an inspector on a subsequent inspection.

5. Design Verification - The inspector reviewed the ASME accepted QA Manual, the design report for Class 1 nuclear valves, the auxiliary valve development test program, the minutes of three design review meetings, supplementary test requirements, stress report for Class 1 nuclear valves, and curve of closing load versus number of cycles to verify that the design verification procedures had been implemented.

6. Design Document Control - The inspector reviewed the ASME accepted QA Manual, WCAP-8370 QA Plan, test curves, test program, supplementary test requirements, four drawings, three customer design specifications, design report, stress analysis, three design meeting minutes, and minutes of safety review committee to verify that the design document control procedures had been implemented.

7. Deficiency Report - The NRC inspector reviewed the Westinghouse EMD data pertaining to the identified potential failure of 3-inch thru 18-inch gate valves to close under flow conditions with system pressure differential across the disc. The test fixture used to verify the friction coefficient of the gate sliding on the seat ring when the valves are operated was inspected, and the test data reviewed. The NRC inspector reviewed the design report to verify that the friction factor used in the original design calculations was less than the friction factor subsequently established by testing. Three Westinghouse EMD letters to a licensee informing them of their evaluation of the failure of the gate valves to close and the presentation on the Westinghouse EMD gate valve closure problem were reviewed. The inspector reviewed the Westinghouse EMD plant/project valve modification program and verified that the licensees have been notified, and corrective action had been planned for all affected sites. Westinghouse EMD was currently conducting functional tests of their gate valves (selective sizes 3-inch thru 18-inch) to confirm their revised design assumptions. The NRC inspector will review the test data and design assumptions on a subsequent inspection. Westinghouse EMD had notified all of the purchasers of their gate valves of the potential failure to close under flow condition at maximum pressure differential, were evaluating each gate valve flow/pressure condition, and planned to advise their customers in regard to required operator modification or replacement. The NRC inspector will review the scope and adequacy of the Westinghouse EMD corrective actions in a subsequent inspection.

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
LARGE MOTOR DIVISION
BUFFALO, NEW YORK

REPORT NO.: 99900111/81-01	INSPECTION DATE(S): 8/11-14/81	INSPECTION ON-SITE HOURS: 34

CORRESPONDENCE ADDRESS: Westinghouse Electric Corporation
Large Motor Division
ATTN: Duane L. Hawkins
Manager, Quality Assurance
4454 Genesee Ave.
Buffalo, New York 14240

ORGANIZATION CONTACT: D. L. Hawkins, Manager, QA
TELEPHONE: (716) 631-1000

PRINCIPAL PRODUCT: Large Electric Motors

NUCLEAR INDUSTRY ACTIVITY: One percent of total sales has been Class 1E large electric motors.

ASSIGNED INSPECTOR: L. B. Parker, Reactive Inspection Section (RIS) — 10/20/81 Date

OTHER INSPECTOR(S): H. W. Roberds, RIS

APPROVED BY: I. Barnes, Chief, RIS — 10/20/81 Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made as a result of the observation by Virginia Electric Power Company (VEPCO) of oil leakage from a North Anna Unt 3 Auxiliary Feedwater Pump Motor during storage. Subsequent examination of the motor, which was manufactured by the Westinghouse Large Motor Division (WLMD), showed that the leakage had occurred because of the presence of casting defects in the lower reservoir of the shaft drive end bearing. The inspection scope was limited to follow up on the identified deficiency.

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
LARGE MOTOR DIVISION
BUFFALO, NEW YORK

REPORT NO.: 99900111/81-01	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Appendix B to 10 CFR Part 50 was not imposed by the purchaser (Bingham Willamette Co.) in the procurement requirements for the Auxiliary Feedwater Pump Motor which subsequently exhibited oil leakage during site storage. In response to questions concerning the differences in quality assurance requirements for commercial and safety grade motors, WLMD identified the differences as consisting essentially of the scope of activities for which documentation is prepared. Examples noted of additional requirements imposed for safety grade motors were as follows: (a) consideration of 10 CFR Part 21 applicability in procurement; (b) documented inspections; and (c) use of separate manufacturing shop orders.

2. The NRC inspectors were unable to verify that original inspection had been performed of the end bearing casting which was subsequently established to contain casting defects, in that no receiving inspection records are maintained for commercial motor items. The WLMD QA Manager indicated that an inspection had been performed of the warehouse stock of end bearing castings as a result of the oil leakage problem. No documentary evidence was available, however, which would allow confirmation of this information.

3. During the inspection:

   a. The NRC inspectors visually inspected Neenah Foundry Company 709J188C13 and 2235C07C04 end bearing castings in the warehouse and on the factory floor. No defects similar to that which caused the oil leak in the 709J188C13 North Anna motor casting; i.e., unfused "pins" or "chaplets" were observed.

   b. A liquid penetrant examination was performed by WLMD of a 709J188C13 casting at the request of the NRC inspectors. No defects were found of a type which could have resulted in oil leakage.

c. The NRC inspectors were shown documentary evidence that the motor with the oil leak and three other WLMD motors, which had been supplied with it by the Bingham Willamette Company, had been returned on April 15, 1981, to a Westinghouse Service Repair Shop (WSRS) in Richmond, Virginia, for examination and repair. WSRS dismantled all four motors and VEPCO examined the end bearing castings. Remnant chaplets were observed in all eight end bearing castings in the motors and evidence of oil leakage was visible in three. WSRS ground down all of the chaplets and seal welded the exterior of the castings by the gas tungsten arc welding process. Sealing of the defects was completed using Belzona and a dye penetrant. Examination was then performed to verify freedom from leaks. Repair operations were then completed by priming the reservoir interior surfaces and epoxy painting.

4. WLMD management informed the NRC inspectors that there was no previous history of this type defect and that the problem was considered an isolated case. No evidence was made available to the NRC inspectors that would indicate any actions had been taken to preclude recurrence of similar problems.

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION, NUCLEAR TECHNOLOGY DIVISION, MONROEVILLE, PENNSYLVANIA

REPORT NO.: 99900404/81-03	INSPECTION DATE(S): 8/17-21/81	INSPECTION ON-SITE HOURS: 29

CORRESPONDENCE ADDRESS: Westinghouse Electric Corporation
Nuclear Technology Division
Attn: Dr. R. J. Slember
General Manager
Post Office Box 355
Pittsburgh, Pennsylvania 51230

ORGANIZATION CONTACT: Mr P. T. McManus, Manager, Product Assurance
TELEPHONE: (412) 273-6268

PRINCIPAL PRODUCT: Nuclear Steam Supply Systems

NUCLEAR INDUSTRY ACTIVITY: The Nuclear Technology Division of Westinghouse Electric Corporation employs approximately 2,212 people, 100% of which are assigned to domestic nuclear power plant activities.

ASSIGNED INSPECTOR: R. H. Brickley — 9/21/81
R. H. Brickley, Reactor Systems Section (RSS) — Date

OTHER INSPECTOR(S): None

APPROVED BY: C. J. Hale — 9-22-81
C. J. Hale, Chief, RSS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B, and Topical Report No. WCAP-8370.

B. SCOPE: A Regional request concerning Volume Control Tank level transmitters, audits, and status of previous inspection findings.

A. VIOLATIONS

None.

B. NONCONFORMANCES

None.

C. UNRESOLVED ITEMS

None.

D. STATUS OF PREVIOUS INSPECTION FINDINGS

(Closed) Follow Up Item (81-02): Calculation No. CN-RPA-76-53, part of the verification package for cycle 2 (version) of computer program MARVEL, could not be located during the inspection.

Calculation No. CN-RPA-76-53 could not be located, therefore, Westinghouse performed another calculation, No. CN-PP-81-174.

E. OTHER FINDINGS OR COMMENTS

1. Volume Control Tank Level Transmitter - Westinghouse had informed the licensee (North Anna 1 & 2) of a 10 CFR Part 21 report involving the Volume Control Tank (VCT) level instrumentation. If one of the two VCT level transmitters fails high, letdown flow would be diverted to the Boron Recovery System. The VCT level would continue to decrease but automatic makeup would not be initiated from the Refueling Water Storage Tank because of the failed level channel. Both level channels are required.

   This particular scenario was not one of the analyses required for plant licensing. It was postulated as a result of a continuing study by Westinghouse involving failure modes and effects analyses involving system interactions. These studies were in response to the issues addressed in Generic Task A-17 of the NRC Program for Resolution of Generic Issues and Recommendation #9 of NUREG-0585, TMI-2 Lessons Learned Task Force Final Report.

   The inspector examined the records maintained on Safety Review Committee (SRC) Item ID 81-177. It was determined that this item was initially identified as Potential Item (PI) 80-85 on March 27, 1980. This item was submitted to the SRC on April 9, 1981. The SRC met on May 19, 1981, and concluded that this scenario could lead to a loss in redundancy in the high head safety injection system and may not meet the intent of the regulations with respect to separation of protection and control systems and single failure criteria. A 10 CFR Part 21 report was submitted to the NRC on May 21, 1981, and a meeting was held on this item with NRC:NRR repre-

sentatives on May 27, 1981. At this meeting, Westinghouse presented their position that timely operator action could negate this scenario and recommended that plant procedures be reviewed to assure that the operator would be properly alerted and take appropriate action. NRR had not responded to the Westinghouse position at the time of this inspection. A proper evaluation appears to have been performed, QA program and applicable reporting requirements followed and all affected licensees notified.

2. Audits - Topical Report WCAP-8370 and the applicable implementing procedures were examined to determine that Westinghouse commitments had been translated into procedural requirements. The records maintained on six internal audits and the training and qualifications of seven auditors were examined to determine that procedural requirements had been followed. It was determined that audits had been conducted in accordance with commitments and applicable procedural requirements.

ORGANIZATION: WOODWARD GOVERNOR COMPANY
ENGINE AND TURBINE CONTROLS DIVISION
FORT COLLINS, COLORADO

REPORT NO.: 99900759/81-01	INSPECTION DATE(S): 9/8-11/81	INSPECTION ON-SITE HOURS: 26

CORRESPONDENCE ADDRESS: Woodward Governor Company
Engine and Turbine Controls Division
ATTN: Mr. J. E. Sundstedt
General Manager
Post Office Box 1519
Fort Collins, CO 80522

ORGANIZATION CONTACT: Mr. J. L. Veitch, Quality Assurance Manager
TELEPHONE: (303) 482-5811

PRINCIPAL PRODUCT: Engine and turbine controls and auxiliaries

NUCLEAR INDUSTRY ACTIVITY: Woodward Governor Company (WGC) supplies controls and auxiliaries (governors) for prime movers. WGC nuclear involvement represents less than one half of one percent of their total production.

ASSIGNED INSPECTOR: Wm D Kelley — 10/21/81
Wm. D. Kelley, Reactive Inspection Section (RIS) — Date

OTHER INSPECTOR(S):

APPROVED BY: I Barnes — 10/23/81
I. Barnes, Chief, RIS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21 and 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made as a result of the issue of a construction deficiency report by Duke Power Company concerning the potential failure of the droop lever spring in the governors for the emergency diesels installed at the William B. McGuire Nuclear Station, Unit 2. Additonal areas selected for inspection included initial management meeting and quality assurance program review.

ORGANIZATION: WOODWARD GOVERNOR COMPANY
ENGINE AND TURBINE CONTROLS DIVISION
FORT COLLINS, COLORADO

REPORT NO.: 99900759/81-01	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

1. Contrary to Section 21.6 of 10 CFR Part 21, neither Section 206, 10 CFR Part 21, nor the permitted substitute notice were posted at the Fort Collins, Colorado, plant.

2. Contrary to Section 21.21 of 10 CFR Part 21, appropriate procedures had not been adopted for the implementation of 10 CFR Part 21.

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Initial Management Meeting - Met with management and those persons responsible for the administration of the QA Program, explained NRC direct inspection program, organization, inspection methods, and documentation.

2. Quality Assurance Program Review - Reviewed QA program, QA manual, general inspection procedure, and eight customer purchaser orders. The QA manual states that the WGC QA system is equal or superior to MIL-Q-9858A. None of the purchase orders reviewed by the inspector imposed Appendix B of 10 CFR Part 50 on WGC. The QA program had been audited by twenty utilities and six original equipment manufactures since 1977.

3. Construction Deficiency Report by Duke Power Company - Problem reported was the failure of droop lever spring in governor for emergency diesels. Three hundred-thirty droop lever springs were returned by WGC to their spring vendor because the hooks were misaligned. The misalignment was corrected by the vendor and the springs were returned to WGC for installation in governors. A total of 308 governors with springs from this lot were shipped to customers. Subsequently, two governors were returned to WGC for repair. The governors were disassembled and inspected, and it was found that the droop lever springs were broken. It was determined that these springs were from the reworked lot. WGC contacted their spring vendor and was informed that the springs had been reworked by cold bending. WGC performed vibration testing on a sample of springs from this lot which resulted in a high failure rate. WGC notified those customers who had received the other 306 governors. At this time, WGC redesigned and manufactured 298 springs, incorporated them in replacement kits, and sent them to the affected customers.

ORGANIZATION: WOODWARD GOVERNOR COMPANY
ENGINE AND TRUBINE CONTROLS DIVISION
FORT COLLINS, COLORADO

REPORT NO.: 99900759/81-01	INSPECTION RESULTS:	PAGE 3 of 3

As of September 11, 1981, WGC could not account for 10 of the 330 defective springs, nor could they identify the 8 remaining governors with defective springs. Follow up will be performed on the latter item in order to verify that none of the governors are installed on nuclear equipment.

ORGANIZATION: WOOLLEY MANUFACTURING DIVISION
CANTON, OHIO

REPORT NO.: 99900390/81-01	INSPECTION DATE(S): 10/19-23/81	INSPECTION ON-SITE HOURS: 31

CORRESPONDENCE ADDRESS: Woolley Manufacturing Division
ATTN: Mr. C. A. O'Deay
Quality Assurance Manager
P. O. Box 1388, Station C
Canton, Ohio 44708

ORGANIZATION CONTACT: Mr. C. A. O'Deay, QA Manager
TELEPHONE: (216) 477-4585

PRINCIPAL PRODUCT: Air Locks, Equipment Hatches, Nuclear and Section VIII Vessels, Steel Plate Fabrications.
NUCLEAR INDUSTRY ACTIVITY: Eight contracts representing approximately 75% of the total workload.

ASSIGNED INSPECTOR: Ross L. Brown
Ross L. Brown, Components Section (CS) — Date: 11/9/81

OTHER INSPECTOR(S):

APPROVED BY: Uldis Potapovs
U. Potapovs, Acting Chief, CS — Date: 11/9/81

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B, 10 CFR Part 21 and other applicable standards.

B. SCOPE: Management meeting and implementation of 10 CFR Part 50, Appendix B, including change control, manufacturing process control, personnel training and qualification, status of previous inspection findings, and 10 CFR Part 21 inspection.

ORGANIZATION: WOOLLEY MANUFACTURING DIVISION
CANTON, OHIO

REPORT NO.: 99900390/81-01	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCES:

Contrary to Criterion V of 10 CFR Part 50, Appendix B and Woolley Manufacturing Division (WMD) Quality Assurance Manual (QAM) Sections 6.0. and Definitions, the QA approval signature or initials and date were not in evidence on quality related drawings, fabrication change notices (FCN), in-process sheets (travelers), and shop order supplements.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

(Closed) Unresolved Item C.3.c. (80-02): The vendor did not have procedures to completely implement the indoctrination and training program requirements.

Section 3.0. of the QAM and Standard Operating Procedures (SOPs) No. 39, establishes guidelines and assigns the responsibility for the qualification and certification of personnel performing quality activities.

Review of indoctrination and training schedule and 16 records of training sessions conducted between November, 1980, and October, 1981, verified that training of engineers, welders, inspector's (QA/QC), purchasing, and production personnel had been performed.

E. OTHER FINDINGS OR COMMENTS:

1. Change Control - Review of drawings, fabrication change notices, in-process sheets, and SO supplements for SO's 27000-N and 23551-N verified conformance with the program requirements relative to identification, justification, engineering approval, distribution, and identification of obsolete documents.

   However, QA approval signature and date were not in evidence on the documents or on a record traceable to the documents (see Paragraph B).

2. Manufacturing Process Control - Review of the in-process sheets, in-process inspection reports, and nondestructive examination (MT and hydrostatic) reports for shop orders SO-27000-N and SO-23551-N verified conformance with the QAM requirements.

3. Personnel Training and Qualification (NDE) - The review of the personnel qualification files, one RT report, two PT reports, and four MT reports verified that the nondestructive examinations were performed by persons qualified in accordance with SNT-TC-1A-1975 Edition and ASME Code.

ORGANIZATION: WOOLLEY MANUFACTURING DIVISION
CANTON, OHIO

REPORT NO.: 99900390/81-01	INSPECTION RESULTS:	PAGE 3 of 3

4. 10 CFR Part 21 Inspection - Review of Standard Operating Procedure No. 36, memorandum to all employees issued by the Vice President of Manufacturing, and two employees bulletin boar verified compliance with the regulatory requirements.

5. Company Name Change:

   February, 1981, the company name was changed:

   From: Irwin Steel Fabricators

   To: Woolley Manufacturing Division

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U.S. NUCLEAR REGULATORY COMMISSION

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Licensee Contractor and Vendor Inspection Status Report
Quarterly Report
October 1981 - December 1981

2. (Leave blank)

3. RECIPIENT'S ACCESSION NO.

7. AUTHOR(S)

5. DATE REPORT COMPLETED
MONTH December YEAR 1981

9. PERFORMING ORGANIZATION NAME AND MAILING ADDRESS (Include Zip Code)
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, DC 20555

DATE REPORT ISSUED
MONTH January YEAR 1982

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8. (Leave blank)

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Same as 9, above.

10. PROJECT/TASK/WORK UNIT NO.

11. CONTRACT NO.

13. TYPE OF REPORT

PERIOD COVERED (Inclusive dates)

15. SUPPLEMENTARY NOTES

14. (Leave blank)

16. ABSTRACT (200 words or less)

This periodical provides the results of inspections performed under the NRC's Licensee Contractor and Vendor Inspection Program that have been distributed to the inspected organizations during the period from October 1981 through December 1981. Also included in this issue are the results of certain inspections performed prior to October 1981 that were not included in previous issues of NUREG-0040.

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NUREG-0040
Vol. 6, No. 1

LICENSEE CONTRACTOR AND VENDOR INSPECTION STATUS REPORT

QUARTERLY REPORT
JANUARY 1982- MARCH 1982

UNITED STATES NUCLEAR REGULATORY COMMISSION

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Vol. 6, No. 1

LICENSEE CONTRACTOR AND VENDOR INSPECTION STATUS REPORT

QUARTERLY REPORT
JANUARY 1982 - MARCH 1982

Manuscript Completed: March 1982
Date Published: April 1982

Prepared by: Region IV
U.S. Nuclear Regulatory Commission
Arlington, TX 76011

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PREFACE

A fundamental premise of the Nuclear Regulatory Commission's (NRC) nuclear facility licensing and inspection program is that a licensee is responsible for the proper construction and safe operation of nuclear power plants. The total government-industry system for the inspection of nuclear facilities has been designed to provide for multiple levels of inspection and verificatin. Licensees, contractors, and vendors each participate in a quality verification process in accordance with requirements prescribed by, or consistent with, NRC rules and regulations. The NRC inspects to determine whether its requirements are being met by a licensee and his contractors, while the great bulk of the inspection activity is performed by the industry within the framework of sequential, ongoing quality verification programs.

In implementing this multilayered approach, a licensee is responsible for developing a detailed quality assurance plan as part of his license application. This plan includes the quality assurance programs of the licensee's contractors and vendors. The NRC reviews the licensee's and contractor's quality assurance plans to determine that implementation of the proposed quality assurance program would be satisfactory and responsive to NRC regulations.

Firms designing nuclear steam supply systems, architect engineering firms doing desing work on nuclear power plants, and certain selected vendors are currently inspected on a regular basis by the NRC. NRC inspectors, during periodic inspections, ascertain through direct observation of selected activities (including review of processes and selected hardware, discussions with employees and selected record review) whether a licensee or contractor is satisfactorily implementing a quality assurance program. If nonconformances with QA commitments are found, the inspected organization is requested to take appropriate corrective action and to institute preventive measures to preclude recurrence.

In addition to the QA program inspections, NRC also conducts reactive inspections of the licensee's contractors and vendors. These are special, limited scope inspections to verify that organizations supplying safety-related equipment or services to licensed facilities are exercising appropriate corrective/preventive measures when defects or conditions which could adversely affect the safe operation of such facilities are identified and that these organizations are complying with the NRC requirements which govern the evaluation and reporting of such conditions.

In the case of principal licensee contractors, such as nuclear steam supply system designers and architect engineering firms, the NRC encourages submittal of a description of corporate-wide quality assurance programs for review and acceptance by the NRC Office of Nuclear Reactor Regulation (NRR). Upon acceptance by NRR, described quality assurance programs provide written bases for inspection on a generic basis, rather than with respect to specific commitments made by a particular licensee. Once accepted by NRR, a corporate quality assurance program of a licensee's contractor will be acceptable for all license applications that incorporate the program by reference in a Safety

Analysis Report. In such cases, a contractor's quality assurance program will not be reviewed by NRR as part of the licensing review process, provided that the incorporation in the SAR is without change or modification. However, new or revised regulations, Regulatory Guides, or Standard Review Plans affecting quality assurance program controls may be applied by NRR to previously accepted quality assurance programs.

The NRC Region IV Office in Arlington, Texas, inspects the implementation of quality assurance programs of nuclear steam supply system designers and architect engineering firms which have ben submitted to, and approved by, NRR in the form of Topical Reports or Standardized Programs. Upon completion of inspections confirming satisfactory implementation of QA programs, NRC will issue a confirming letter to the nuclear steam system supplier or architect engineering firm.

Licensees and applicants that have referenced the NRR approved Topical Report, or Standardized Program, in Safety Analysis Reports (or have adopted the total quality assurance program described in the Topical Report or Standardized Program) may, at their option, use the confirming letter to fulfill their obligation under 10 CFR Part 50, Appendix B, Criterion VII, that requires them to perform initial source evaluation audits and subsequent periodic audits to verify quality assurance program implementation. For additional details concerning the NRC letter, refer to "SAMPLE LETTER" included in this report.

Licensees or construction permit holders may choose not to make use of a contractor's NRC accepted program, or such an accepted program may not exist. In such cases, the Region IV inspections of nuclear steam supply system designers, architect engineering firms, or other licensee contractors, sub-tier contractors, or suppliers, will be based on programs developed to meet the commitments made by the licensee or construction permit holder. These Region IV inspections will not relieve the licensees or applicants from any inspection/verification responsibilities required by Criterion VII.

The NRC currently is continuing their evaluation of a proposed program for NRC acceptance of third-party (ASME) certification of Vendor Quality Assurance programs. Should the proposed program be endorsed by NRC, it is anticipated that, subject to NRC audits of the third-party program, licensees and applicants would be able to use the ASME nuclear certification and inspection system to fulfill that part of their obligation under 10 CFR Part 50, Appendix B, Criterion VII, which required them to perform initial source evaluation/selection audits and subsequent periodic audits to assess the quality assurance program implementation.

A third party category of firms consists of organizations whose quality assurance programs or manufacturing processes have not been reviewed and approved by NRR, or by a third party (such as ASME). This category of firms is subject to NRC inspection based on the safety significance and performance of products or services provided by such firms. Since such firms will not receive a third-party review of their QA programs, results of the direct NRC inspections may not be used to fulfill the licensee's obligations under Criterion VII.

The White Book contains information normally used to establish a "qualified suppliers" list; however, the information contained in this document is not

adequate, nor is it intended to stand by itself as a basis for qualification of suppliers.

Correspondence with contractors and vendors relative to the inspection data contained in the White Book is placed in the USNRC Public Document Room, located in Washington, D.C.

Copies of the White Book may be obtained at a nominal cost by writing to the National Technical Information Service, Springfield, Virginia 22161.

ORGANIZATION: COMPANY, DIVISION
CITY, STATE

REPORT NO. Docket/Year Sequence	INSPECTION DATE(S):	INSPECTION ON-SITE HOURS:

CORRESPONDENCE ADDRESS: Corporate Name
Division
ATTN: Name/Title
Address
City/State/Zip Code

SAMPLE PAGE (EXPLANATION OF FORMAT AND TERMINOLOGY)

ORGANIZATION CONTACT: Name/Title
Telephone Number

PRINCIPAL PRODUCT: Description of type of components, equipment, or services supplied.

NUCLEAR INDUSTRY ACTIVITY: Brief statement of scope of activity including percentage of organization effort, if applicable.

ASSIGNED INSPECTOR: (Signature) _____ _____
Name/VPB Section Date

OTHER INSPECTOR(S): Name/VPB Section

APPROVED BY: (Signature) _____ _____
Name/VPB Section Date

INSPECTION BASES AND SCOPE:

A. BASES: Pertain to the inspection criteria that are applicable to the activity being inspected, i.e., 10 CFR Part 21, Appendix B, and SAR or Topical Report commitments.

B. SCOPE: Summarizes the specific QA program areas that were reviewed, and/or identifies plant systems, equipment or specific components that were inspected. For reactive (identified problem) inspections, the scope summarized the problem that caused the inspection to be performed.

PLANT SITE APPLICABILITY: Lists docket numbers of licensed facilities for which equipment, services or records were examined during the inspection.

ORGANIZATION, COMPANY, DIVISION
CITY, STATE

REPORT NO:	INSPECTION RESULTS:	Page 2 of 2

A. VIOLATIONS: Shown here are any inspection results determined to be in violation of Federal Regulations (such as 10 CFR Part 21) that are applicable to the organization being inspected.

B. NONCONFORMANCES: Shown here are any inspection results determined to be in nonconformance with applicable commitments to NRC requirements. In addition to identifying the applicable NRC requirements, the specific industry codes and standards, company QA Manual sections, or operating procedures which are used to implement these commitments may be referenced.

C. UNRESOLVED ITEMS: Shown here are inspection results about which more information is required in order to determine whether they are acceptable items or whether a Violation or Nonconformance may exist. Such items will be resolved during subsequent inspections.

D. STATUS OF PREVIOUS INSPECTION FINDINGS: This section is used to identify the status of previously identified Violations, items of Nonconformance and/or Unresolved Items until they are closed by appropriate action. For all such items, this section will indicate open/closed classification, identify the inspection report which first produced the item, describe the nature of the item, and if closed, include a brief statement concerning action which closed the item. If this section is omitted, all previous inspection findings have been closed.

E. OTHER FINDINGS OR COMMENTS: This section is used to provide significant information concerning the inspection areas identified under "Inspection Scope." Included are such items as mitigating circumstances concerning a Violation or Nonconformance, statements concerning the limitations or depth of inspection. (Sample Size, type of review performed) and special circumstances or concerns identified for possible follow up. For reactive inspections, this section will be used to summarize the disposition or status of the condition or event which caused the inspection to be performed.

SAMPLE PAGE
(EXPLANATION OF FORMAT AND TERMINOLOGY)

CONTRACTORS WITH NRC LETTERS CONFIRMING QA PROGRAM IMPLEMENTATION

(SEE NEXT PAGE FOR EXAMPLE OF CONFIRMING LETTERS)

CONTRACTOR	TOPICAL REPORT	REVISION	DATE OF NRC LETTER
BABCOCK & WILCOX	BAW 10096A	REVISION 1	DECEMBER 30, 1975
STONE & WEBSTER	SWSQAP 1-74	REVISION A	DECEMBER 30, 1975
WESTINGHOUSE NTD	WCAP-8370	REVISION 9A	APRIL 30, 1981
BECHTEL-GAITHERSBURG	BQ-TOP-1	REVISION 2A	MARCH 16, 1981
BECHTEL-SAN FRANCISCO	BQ-TOP-1	REVISION 3A	JUNE 12, 1981
EBASCO SERVICES, INC.	ETR-1001	REVISION 8A	MARCH 31, 1980
COMBUSTION ENGINEERING	CENPD-210-A	REVISION 3	JUNE 2, 1981
GIBBS & HILL, INC.	GIBSAR 17-A	AMENDMENT 2	MARCH 31, 1977
UNITED ENGINEERS & CONSTRUCTORS	UEC-TR-001-3A	AMENDMENT 5	MARCH 31, 1977
GENERAL ELECTRIC CO.	NEDO-11209-04A	N/A	MARCH 30, 1977
SARGENT & LUNDY ENGINEERS	SL-TR-1A	REVISION 5	MAY 17, 1979
BECHTEL-LOS ANGELES	GQ-TOP-1	REVISION 2A	JUNE 5, 1979
GILBERT-COMMONWEALTH	GAI-TR-106	REVISION 2A	FEBRUARY 2, 1981
BECHTEL-ANN ARBOR	BQ-TOP-1	REVISION 2A	MAY 7, 1981

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TEXAS 76011

(ADDRESSEE)

Gentlemen:

A series of Nuclear Regulatory Commission (NRC) inspections have been conducted to review your implementation of the Quality Assurance Program applicable to NRC applicants or licensees who have contracted for services from the (applicable corporate entity). These inspections consisted of selective examination of procedures and representative records, interview of personnel, and direct observation by the inspectors. As a result of these inspections, the NRC has concluded that the QA program described in Topical Report _____ is being implemented satisfactorily. Neither this conclusion nor the remainder of this letter applies to manufacturing activities or construction related activities conducted at reactor sites.

Licensees and applicants that have referenced the above Topical Report in their Safety Analysis Reports (or have adopted the total quality assurance program described in that Topical Report) may, at their option, use this letter to fulfill their obligation under 10 CFR Part 50, Appendix B, Criterion VII, that requires them to perform initial source evaluation/ selection audits and subsequent periodic audits to assess the quality assurance program implementation.

The NRC expression of satisfaction with the implementation of your QA program does not assure that a specific product or service offered by you to your customer is of acceptable quality, nor does it relieve the applicant or licensee from the general provision of Criterion VII which requires verification that purchased material, equipment, or services conform to the procurement documents. It is recognized that in some cases this assurance can be made by the applicant or licensee without audits or inspections at your facility.

Continuing acceptability of implementation of your QA program is contingent upon your maintaining a satisfactory level of program implementation, certified through periodic NRC inspection, throughout all corporate organization units and nuclear projects encompassed by your program. Should your program implementation at any time be found unacceptable you will be notified by letter and requested to correct the deficiencies promptly. In the

event you fail to correct the deficiencies promptly, or if the record of deficiencies is such as to indicate generally poor program implementation, you and the applicants and licensees who have referenced your QA program will be notified that the generic implementation of your program is no longer acceptable to the NRC. All of the audit/inspection requirements of Criterion VII, Appendix B, 10 CFR Part 50, must then be implemented by the applicants or licensees. The NRC will reinstate its letter of acceptability of implementation of your QA program only after our inspectors have concluded, based on reinspection, that you have again demonstrated full compliance.

Except as noted above, the conclusions expressed in this letter will be effective for three years from the date of issue of the letter. At that time, program performance over the previous three year period will be evaluated and this letter reissued, if appropriate.

The results of our inspections are published quarterly in the Licensee Contractor and Vendor Inspection Status Report (NUREG 0040), which is made available to NRC facility applicants, licensees, contractors, and vendors, as well as to members of the public, by subscription.

Sincerely,

Regional Administrator

ORGANIZATION: ANCHOR DARLING VALVE COMPANY
WILLIAMSPORT, PA

REPORT NO.: 99900053/81-01	INSPECTION DATE(S): 10/26-30/81	INSPECTION ON-SITE HOURS: 30

CORRESPONDENCE ADDRESS: Anchor Darling Valve Company
ATTN: Mr. J. W. Marlatt
General Manager
701 First Street
Williamsport, PA 17701

ORGANIZATION CONTACT: Mr. G. W. Kneiser, Quality Assurance Manager
TELEPHONE: (717) 323-6121

PRINCIPAL PRODUCT: Nuclear Valves

NUCLEAR INDUSTRY ACTIVITY: Anchor Darling Valve Company's contribution to the nuclear industry represents approximately 60 percent of its total work load.

ASSIGNED INSPECTOR: I. Barnes for Wm. D. Kelley, Reactive Inspection Section (RIS) 12-30-81 Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes I. Barnes, Chief, RIS 12-30-81 Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21 and 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made as a result of the issuance of licensee event reports by: (1) Arkansas Power and Light Company concerning both the discovery of missing parts in a four inch swing check valve which had been installed in the Arkansas Nuclear One, Unit 2 facility, and the identification from the retrieved parts of the use of a lock wire in assembly rather than a drawing specified cotter pin; and (2) Southern California Edison Company concerning the failure of San Onofre Unit 1 double disc parallel seated gate valves to open upon receipt of a valid safety injection signal. Additional areas selected for inspection included design control, testing of completed products and records.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Anchor Darling Valve Company (ADVC) Drawing No. 9362F, two 30 x 24 x 30 inch parallel seated gate valves on Order No. 1024-001-001 for Washington Public Power Supply System Nuclear Project 2 were shipped with the by-pass installed on the opposite side of the valves to that specified by the drawing.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 4.2.1.10 in Westinghouse Equipment Specification 675198, it could not be verified that the yoke mounting flange in San Onofre Unit 1, 14 x 10 x 14 inch gate valves was designed to withstand the specified seismic loading and applied stresses, in that an incorrect equation was used for performing the analysis.

C. UNRESOLVED ITEMS:

Review of assembly drawings for the ADVC double disc, parallel seated, gate valves showed that required disc-seat clearances had not been included. As a result of the 1977 start up history, it would appear that the adequacy of controls for these dimensions may be insufficient. A review of stacked dimensional tolerances for the component parts will be made at the next scheduled inspection, in order to ascertain whether this had been a contributory factor to the identified failure of the valves to open at San Onofre.

D. OTHER FINDINGS OR COMMENTS:

1. Licensee Event Report By Arkansas Power and Light Company - Problem reported was the discovery of missing disc nut, washer, cotter pin, and stud of a four inch swing check valve that had been furnished to Arkansas Nuclear One, Unit 2; also, the retrieved parts indicate a tack welded lock wire had been used instead of the cotter pin specified on the assembly drawing. The valve was manufactured in the ADVC Hayward, California plant which was subsequently closed (September 1981), and all records transferred to the Williamsport, Pennsylvania plant. The assembly drawing specifies that the nut and stud be pinned with a 1/8 inch diameter by 1½ inch long cotter pin and the stock requisition indicated that this cotter pin was requisitioned; however, the assembly

inspection traveler line had the traveler line item, "Tack Welds and Set Screws Secure," signed off and dated. During the time frame in which this valve was assembled, the Hayward plant used lock wires in the assembly of Navy, marine and some commercial valves. Shop travelers were not retained by ADVC as part of the permanent records; however, the NRC inspector was informed that these travelers would not have shown if the assembler had substituted a lock wire with a tack weld for the cotter pin.

ADVC supplied new replacement parts for the valve to the licensee with a recommendation that the nut and stud be drilled and pinned and the pin be captured by peening. No further corrective action is planned by ADVC.

2. Licensee Event Report by Southern California Edison - Problem reported was the failure of the 14 x 10 x 14 inch ADVC double disc parallel seated gate valves which had been furnished to the San Onofre Nuclear Generating Station to open upon a valid Safety Injection System signal.

   a. Background

      These valves were purchased from ADVC by Westinghouse Electric Company Atomic Power Division (W-APD) on their purchase order 54-J-45425B, dated December 8, 1964. The W-APD purchase order specified that the valves meet ASA B16.5 and W-APD Equipment Specification E-675198, Revision 1. No manufacturing or test records were required to be or actually retained for the valves, and a Seismic Report was the only available design document at the time of this inspection.

      In 1975, prior to start up of the San Onofre Nuclear Generating Station, SCE requested ADVC to submit a proposal for changing the closing time of the SIS valves from 10 seconds to 5 seconds. The request asked for the proposal to include both the Limitorque (LC) electric motor operators and the Greer Hydraulics Inc. (GHI) hydraulic actuators. ADVC supplied both manufacturers the required thrust (33160#) to open the valves (851A&B and 852A&B) based on a friction factor of 0.2. ADVC recommended their valves be equipped with a LC motor operator. On December 8, 1975, ADVC sent TLX677268 to SCE which stated, "A/DC assumes no responsibility for Greer Operators."

SCE elected to accept the proposal for the GHI actuators; therefore, ADVC designed a yoke in accordance with ASME Section III, 1974 Edition with Summer 1974 Addendum, to mount the GHI actuators on the exisitng valve bodies. The yokes, stems, and adapters were manufactured at ADVC and shipped to SCE San Onofre, Unit 1, and installed in late 1976 with ADVC field service engineers and manager of engineering on site for assistance and technical advice during assembly.

b. Valve Problems During Plant Start Up

During plant start up in January 1977 it was found that the GHI actuators were unable to open some of the SIS valves with the design pressure differential across the valve discs. Disassembly of the valves revealed the following defective conditions: (1) the bridge in the bottom of the valves and the bridge on the bottom of the lower wedge were deformed (brinnelled) where they made contact; (2) the stellite contact surfaces on the back of the wedges did not make contact when the valves were in the closed position; (3) the pinned screwed connection between the stem and top wedge was loose on some valves; (4) axial misalignment of the actuator and valve stem on valve 851A; and (5) cracks in the back-seats of valves 851A&B, and 852B. A program was established to recondition the valves which included polishing the stem surfaces, reworking the stem-to-upper pinned connections to prevent motion, reworking the upper wedge elongated disc pin holes, reworking the stellite bearing surfaces of the wedges to ensure contact, reworking and modifying the lower wedges to reduce bearing stresses, refinishing the discs to restore them to as-new condition, refinishing the valve seat ring stellite surfaces, and replacing cracked back-seats.

The valves were reassembled and the startup testing of the SIS was continued. Valve 851B operated progressively slower in the opening stroke for five cycles of operation and failed to open on the sixth cycle. The valve was disassembled and inspection revealed a damaged downstream disc and seat ring and an inadequate clearance between the disc-wedge assembly and the seat rings. The ADVC assembly drawing for the SIS valves do not specify the clearance but depend on the stacked tolerance of the parts during assembly to provide the necessary clearance. The other seven valves in the SIS were disassembled and the clearance in six valves was less than the ADVC recommended clearance of 0.20 to 0.13 inches and had damaged stellite seating surfaces

on the discs and seat rings. The clearances between the stacked discs and wedges and the seat rings were increased to bewteen 0.10 and 0.13 inches by machining the disc stellite faces. The seat rings and disc faces were relapped and the valves reassembled and successfully passed the startup test.

One nonconformance and one unresolved item were identified.

c. Corrective Actions

SCE has issued a design specification (Mini-Specification SI-M-8185-V-1) for replacement valves for the safety injection system using a stored energy activation system. The design specification requires each representative valve-actuator design combination to be tested 100 cycles in such a way that the design differential pressure will be developed across the disc.

d. Items Requiring Follow Up Inspection

Review of the Seismic Report applicable to these valves showed that a friction factor of 0.2 had been used in the calculations. The validity of this factor could not be established during the inspection for contacting stellite to stellite surfaces, and will be further reviewed during a subsequent inspection.

3. Design Document Control - Reviewed one section of the ASME accepted QA Manual, four engineering standards, four drawings and one set of calculations. Verified procedures had been implemented to control review, approval, release and issuance of design documents.

4. Inspection and Test - Testing of Completed Products - Reviewed one section of the ASME accepted QA Manual, one quality assurance standard, three engineering process standards and the test stations. Verified: (a) test procedure was available at test station; (b) test data had been documented; (c) test had been performed in accordance with procedure; and (d) test instrumentation had been calibrated. One nonconformance was identified.

5. Records - Reviewed one section of the ASME accepted QA Manual, one engineering material standard, one records retention standard, and three valve data packages. Verified: (a) records that must be retained were identified; (b) procedure identified how and where records are to be stored; (c) the procedures and necessary resources were available to the personnel identifying and filing quality assurance records; and (d) the records were filed and protected in accordance with the QA Manual and procedure requirements.

ORGANIZATION: ASSOCIATED PIPING AND ENGINEERING CORPORATION
DIVISION OF JOHNSON CONTROLS
COMPTON, CALIFORNIA

REPORT NO.: 99900070/81-01	INSPECTION DATE(S): 12/7-11/81	INSPECTION ON-SITE HOURS: 36

CORRESPONDENCE ADDRESS: Associated Piping and Engineering Corporation
Division of Johnson Controls
ATTN: H. A. Anderson
Executive Vice President
1707 West Compton Boulevard
Compton, California 90224

ORGANIZATION CONTACT: H. A. Anderson, Executive Vice President
TELEPHONE: (213) 537-7200

PRINCIPAL PRODUCT: Nuclear Piping Assemblies

NUCLEAR INDUSTRY ACTIVITY: 80% of Production Devoted to Nuclear Products

ASSIGNED INSPECTOR: I. Barnes for H. W. Roberds, Reactive Inspection Section (RIS) 1-15-82 Date

OTHER INSPECTOR(S): D. D. Driskill, Investigator

APPROVED BY: I. Barnes I. Barnes, Chief, RIS 1-15-82 Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B, and 10 CFR Part 21.

B. SCOPE: This inspection was made as a result of the identification to Region IV of the Nuclear Regulatory Commission, that alterations had been detected in WPPSS-WNP 3/5 piping weld radiographs, in regard to mechanical enhancement of specified penetrameter 4-T hole images. This inspection was accomplished by review of radiographs and pertinent correspondence and interviews with cognizant personnel.

ORGANIZATION: ASSOCIATED PIPING AND ENGINEERING CORPORATION
DIVISION OF JOHNSON CONTROLS
COMPTON, CALIFORNIA

REPORT NO.: 99900070/81-01	INSPECTION RESULTS:	PAGE 2 of 2

A. VIOLATIONS:

None

B. NONCONFORMANCE:

Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section V, Article 2 of the ASME Code, radiography of pipe welds with wall thickness of less than 1/2 inch was not performed with a technique of sufficient sensitivity to display the penetrameter image and the specified hole for certain piping assemblies furnished to WPPSS-WNP 3/5. During Ebasco review of radiographs for acceptability, it was identified that certain radiographs had been mechanically altered to include an artificial representation of the specified 4-T hole of the penetrameter.

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Nuclear Regulatory Commission, Region V Referral of Penetrameter 4-T Hole Image Enhancement on Radiographs of Piping Welds Fabricated by Associated Piping and Engineering Corporation (AP&E)

It was discovered that some radiographs of Class 1 and 2 pipe welds, fabricated by AP&E for WPPSS-WNP 3/5, had been mechanically altered to include an artifical representation of the specified 4-T hole of the penetrameter. The altered radiographs appear to be limited to pipe that is less than 1/2 inch wall thickness and where the radiographic technique used required the penetrameter selection be based on the single wall thickness of the pipe. As the result of an investigation by the NRC Region IV office, it was established that radiographs had been altered, on occasion, for approximately eight years. The method of alteration to the radiographs consisted of enhancing the image of the applicable penetrameter T-hole with a lead pencil, thereby making unacceptable or questionable quality radiographs appear to be acceptable when viewed under normal conditions. AP&E in conjunction with Ebasco has reviewed all radiographs of pipe welds supplied to WPPSS-WNP 3/5 and those radiographs of welds that had been altered were reradiographed and interpreted with no rejectable discontinuities noted. The investigation revealed that one person was responsible for altering the radiographs and he was discharged from the company immediately upon disclosure of this discrepancy. AP&E issued a memorandum to all radiographic personnel stating that any person found responsible for the improper use of equipment or alterations of radiographs in any illegal way, will be subject to immediate termination with the company.

ORGANIZATION: BABCOCK & WILCOX COMPANY
NUCLEAR MATERIALS DIVISION
LYNCHBURG, VIRGINIA

REPORT NO.: 99900001/82-01	INSPECTION DATE(S) 2/1-5/82	INSPECTION ON-SITE HOURS: 25

CORRESPONDENCE ADDRESS: Babcock & Wilcox Company
Nuclear Materials Division
ATTN: Mr. John MacMillan
Vice President
Lynchburg, VA 24505

ORGANIZATIONAL CONTACT: Mr. J. Ficor, QA Manager
TELEPHONE NUMBER: (804) 522-5618

PRINCIPAL PRODUCT: Nuclear Fuel Assemblies

NUCLEAR INDUSTRY ACTIVITY: Major nuclear fuel supplier to B&W cores.

ASSIGNED INSPECTOR: W. M. McNeill — 3/19/82
W. M. McNeill, Reactive & Components Program Section (R&CPS) — Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes — 3/19/82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: Procurement controls; document controls; audits; and status of previous inspection findings.

PLANT SITE APPLICABILITY: No determined applicability.

ORGANIZATION: BABCOCK & WILCOX COMPANY
NUCLEAR MATERIALS DIVISION
LYNCHBURG, VIRGINIA

REPORT NO.: 99900001/82-01	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCES:

Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph V of the manufacturing procedure MA-1200, the formal canvas of document recipients has not been performed at least in the last year.

C. UNRESOLVED ITEMS

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

(Closed) Nonconformance (81-02): A Purchase Material List did not denote the specifications for Upper End Fittings. Different revision levels of specifications were found on a Purchase Requisition to those contained in the Purchase Material List for Lower End fittings. A review of current Purchase Material Lists and Purchase Requisitions found the specifications in order. Purchase Requisitions are now checked against the Purchase Material List and Purchase Material Lists are compared to a master Purchase Material List.

E. OTHER FINDINGS OR COMMENTS:

1. Procurement Controls - The procurement of fuel rod clad was inspected. The auditing and approval of the subvendor was verified. The review and approval of the subvendor's QA Manual, process outline and inspection plan were verified. Recent accepted lots were inspected. The conformance to the specification and design requirements was verified by review of the certification data.

2. Document Controls - A sample of 80 documents was inspected at five different work locations. These work locations varied from the shop "hot" areas to receiving and to the QC office. Eleven different types of documents were sampled which ranged from inspection and manufacturing procedures to specifications, design special instructions and work

ORGANIZATION: BABCOCK & WILCOX COMPANY
NUCLEAR MATERIALS DIVISION
LYNCHBURG, VIRGINIA

REPORT NO.: 99900001/82-01	INSPECTION RESULTS:	PAGE 3 of 3

orders. The review and approval of these documents and their changes were verified. The release and control were inspected. One nonconformance was identified in this area. Manufacturing documents should have their distribution check twice a year. In this way the final destination of a document is verified and when a revision is issued the obsolete document can be located and recalled. A procedure MA-328, Revision 3, was found at a work location although Revision 4 was issued on November 20, 1981. The loss of control of this document appears to have been related to the failure to check the adequacy of its distribution.

3. Audits - The five internal audits completed recently were inspected. The training of the auditors was verified. The identification of problems and follow-up were found to be in accordance with procedures. The review of corrective action and its approval were also found to be in accordance with procedures. Audits were performed with plans and check lists an established schedule and entailed a comprehensive review of the entire QA/QC program.

ORGANIZATION: BARTON INSTRUMENTS
CITY OF INDUSTRY, CALIFORNIA

REPORT NO.: 99900113/82-01	INSPECTION DATE(S): 1/4-8/82	INSPECTION ON-SITE HOURS: 27

CORRESPONDENCE ADDRESS:
Barton Instruments
A Unit of International Telephone
and Telegraph Corporation
ATTN: Mr. T. J. Shideler
General Manager
900 South Turnbull Canyon Rd.
City of Industry, CA 91749

ORGANIZATION CONTACT: Mr. G. R. Welt, Director of Quality Assurance
TELEPHONE: (213) 961-2546

PRINCIPAL PRODUCT: Process Control Instrumentation

NUCLEAR INDUSTRY ACTIVITY: The current nuclear Class 1E equipment percentage output for the Barton Instrument Company is 9.6%. The plant has 108 active orders for 34 different customers.

ASSIGNED INSPECTOR: R. E. Oller — 2-17-82
R. E. Oller, Components Section — Date

OTHER INSPECTOR(S):

APPROVED BY: U. Potapovs — 2-18-82
U. Potapovs, Chief, Acting Chief, CS — Date

INSPECTION BASES AND SCOPE:

A. BASES: Appendix B to 10 CFR Part 50 and 10 CFR Part 21.

B. SCOPE: Status of previous inspection findings; manufacturing process control; change control; nonconformances and corrective action; and 10 CFR Part 21 implementation.

ORGANIZATION: BARTON INSTRUMENTS
CITY OF INDUSTRY, CALIFORNIA

REPORT NO.: 99900113/82-01	INSPECTION RESULTS:	PAGE 2 of 5

A. VIOLATION:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Deviation A (79-01): Failure by Document Control to assure that before accepting engineering Document Release Notices, that the appropriate approval signatures were in the allocated spaces, as required by paragraph 5.2 of Standard Practice No. EN-1, dated April 26, 1978.

   The inspector verified that in accordance with the vendor's corrective action response letters dated, May 11 and June 13, 1979, the Standard Practice No. EN-1 was revised and a new related engineering instruction No. EI-002 was issued on August 3, 1979, to provide specific instructions for proper completion of Document Release Notices. This instruction also provided for the Checker to verify that all entries on DRNs are complete.

   Review of three current DRNs verified that these documents are being properly signed off.

2. (Closed) Deviation A.2 (79-01): Failure by the Change Board to provide approval release signatures on Engineering Order No. 8320, as required by paragraphs 4.2.1 and 4.2.1.5 of Standard Practice No. EN-2-1, dated June 30, 1977.

   The inspector verified that in accordance with the vendor's corrective action response letters dated, May 11 and June 13, 1979, the Standard Practice No. EN-2-1 was revised and reidentified as EN-2 and a new related engineering instruction No. EI-003 was issued on September 9, 1979, to provide specific instructions for proper completion and signoffs of Engineering Orders. This instruction also provided for the Checker to verify that all entries on the EOs are complete.

   Review of three current EOs verified that these documents are being properly signed off.

3. (Closed) Deviation B (79-01): Failure to meet the response letter commitment date of April 21, 1978, for changing the audit procedure QAI No. 18-01 to include audit of Inspection Indoctrination, as committed to in Barton Instrument's corrective action response letter dated April 21, 1978.

   The inspector verified that in accordance with the vendor's response letter dated, May 11, 1979, the reason for the delay in issuing the audit instruction QAI No. 18-01, was that a complete rewrite of all standard practices, instructions, and the QA Manual occurred in 1978. As a result, QAI No. 18-01 was issued on September 29, 1978, after the issue of the new QA Manual Sections QU-18 "Internal Audits" and QU-19 "Training and Qualification of Personnel" on April 7, 1978 and April 4, 1978, respectively. This condition has been reviewed at Barton and the QA Program Manager is now aware of the need to notify the NRC concerning changes in commitments.

4. (Closed) Deviation C (79-01): Failure to correct the referenced documents (Manufacturing Instruction and Production Orders) for P/Ns 0764-10034 and 0764-1060B, by placing dates at location of inspection stamps, as commited to in Barton's corrective action response letter, dated April 21, 1978.

   The inspector verified that in accordance with the vendor's response letter dated, May 11, 1979, the referenced documents have been corrected by placing dates at the location of the inspection stamps. The inspection personnel were given formal training concerning proper completion of Manufacturing Instructions and Production Order (travelers) in August and September 1978.

   Review of three recently completed MIs verified that the inspectors are placing dates after the inspection stamps as required.

5. (Closed) Deviation D (79-01): Failure to meet the April 21, 1978, date for performing the Supplier Control and Test Control audits as committed to in Barton's corrective action response letter dated April 21, 1978.

   The inspector verified that in accordance with the vendor's response letter dated, May 11, 1979, that although Supplier Control was not audited until May 31, 1978, and Test Control was not audited until June 24, 1978, this condition has not continued. Review of internal audit records verified that the subject areas have since been audited to a specified schedule. Yearly schedules for the entire QA program have been established and implemented.

6. (Closed) Deviation E (79-01): Failure to meet the June 1, 1978, date for establishing the procedure No. QU-7, relating to selection of suppliers, as committed to in Barton's corrective action response letter dated April 21, 1978.

   The inspector verified that in accordance with the vendor's response letter dated May 11, 1979, the reason for the late issue of the QA Manual procedure QU-7, on July 10, 1978, was that this procedure was not completed through the signature approval cycle prior to June 1, 1978. This condition has been reviewed at Barton and the QA Program Manager is now aware of the need to notify the NRC concerning changes in commitments.

E. OTHER FINDINGS OR COMMENTS:

1. Manufacturing Process Control - The inspector reviewed seven sections of the vendor's QA Manual No. 81-11-162, Revision No. 1, which were applicable to material receiving, parts manufacture, assembly, inspection, qualification testing and test control of IE safety-related differential pressure transmitters.

   Observations were made of: identification of raw materials; inprocess parts in the machine shop; parts and subassemblies inspection; transmitter assembly; hydrostatic tests; calibration tests and final inspection of completed transmitters.

   To verify that parts manufacture and inspection, and transmitter assembly, hydrostatic tests, calibration tests and final inspections are controlled and documented in accordance with requirements, review was made of: two customer purchase orders; shop copies of four Manufacturing Instructions (travelers) for in-process parts; five Registrars (travelers) for transmitters in various stages of assembly; ten MIs (travelers) for completed parts, and six assembly procedures.

   Within this area, no nonconformances to NRC, customer order, or QA program requirements were identified, and no unresolved items were identified.

2. Change Control - The inspector reviewed two sections of the vendor's QA Manual which were applicable to changes to design and manufacturing documents.

   To verify that changes in design and manufacturing documents for differential pressure transmitters were controlled and documented, a review was made of: four engineering and manufacturing standards; six records of Document Change Requests, Document Request Notices

and Engineering Orders, a Change Control Board Log; ten record packages, each consisting of one or more records such as Standard Distribution Sheets, EOs, DCRs, DRNs, Drawings, and Revised Data Computer Inputs.

Within this area, no nonconformances to NRC, customer order, or QA Program requirements were identified, and no unresolved items were identified.

3. Nonconformances and Corrective Action - The inspector reviewed two sections of the vendor's QA Manual which were applicable to the control and disposition of nonconformances in materials, parts, subassemblies and components received from subvendors and/or identified during parts manufacture, and transmitter assembly identified or found during performance of other QA program activities.

   To verify that nonconforming items were reviewed and accepted, rejected, repaired, or reworked, and that conditions adverse to quality, including the cause, are promptly identified and corrected, a review was made of: three QA Instructions; an Internal Cause and Corrective Log; seven Corrective Action Requests and the related Reject Reports; a Request for Corrective Action Log for vendors; five Request for Corrective Action (vendor's) and the related correspondence; and a letter log for delinquent vendors. Observations were made of a caged segregation area for nonconforming items.

   Within this area, no nonconformances to NRC, customer order, and/or QA program requirements were identified, and no unresolved items were identified.

4. 10 CFR Part 21 - The inspector reviewed the vendor's Standard Practice Notice No. GE-12, "NRC Regulations to 10 CFR Part 21" (Effective January 5, 1978), to verify that adequate documented measures were available to meet the reporting requirements of 10 CFR Part 21.

   Observations of the employee's bulletin board verified that the above vendor notice and Section 206 of the Energy Reorganization Act of 1974, were posted.

   Within this area no violations were identified.

ORGANIZATION: BECHTEL POWER CORPORATION, LOS ANGELES POWER DIVISION,
HOUSTON AREA OFFICE
HOUSTON, TEXAS

REPORT NO.: 99900521/81-03	INSPECTION DATE(S): 11/16-18/81	INSPECTION ON-SITE HOURS: 38

CORRESPONDENCE ADDRESS: Bechtel Power Corporation
Los Angeles Power Division
ATTN: Mr. J. V. Morowski
Vice President and General Manager
P. O. Box 60680, Terminal Annex
Los Angeles, CA 90060

ORGANIZATION CONTACT: Mr. R. L. Patterson, QA Manager
TELEPHONE: (213) 864-6011, ext. 2061

PRINCIPAL PRODUCT: Architect Engineering Services

NUCLEAR INDUSTRY ACTIVITY: The Los Angeles Power Division, Houston Area Office, is assuming the responsibility for the design, procurement and construction management of the South Texas Project Units 1 and 2. At the present time, they are staffing the Houston Area Office and have 129 people in the design office and 23 at the jobsite.

ASSIGNED INSPECTOR: L. G. Breaux / J. R. Costello — 12/3/81
J. R. Costello, Reactor Systems Section (RSS) — Date

OTHER INSPECTOR(S): D. G. Breaux, RSS

APPROVED BY: C. J. Hale — 12-23-81
C. J. Hale, Chief, RSS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B, and Topical Report No. BQ-TOP-1.

B. SCOPE: Review of Transition Phase Procedures and their implementation plus four specific requests relating to the South Texas Project:

1. Follow-up inspection request resulting from a VIB inspection of Corporate Consulting and Development Co., relating to discrepancies with the seismic qualification of cable trays and a pump.

2. Follow-up inspection request by IE Headquarters relating to three reportable defects under 10 CFR Part 21 regarding Brown & Root design activities:

   (a) diesel generator fuel oil storage tank room fan motor qualification;

   (b) gantry crane tornado design, and

B. SCOPE (Cont.):

(c) recirculation piping overstress

3. Follow-up inspection request by IE Headquarters relating to wedge-type expansion anchors supplied by Hilti, Industries, Inc.

4. Follow-up inspection relating to a Houston Lighting & Power Company 10 CFR 50.55(e) report, concerning a breakdown in the quality program for the procurement cycle of purchased materials and equipment.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Review of Transition Phase Procedures and their Implementation - In order to accomplish the transition, Bechtel has divided the project into approximately 130 work packages which will be reviewed in accordance with a manual entitled "South Texas Project Transition Procedures Phase A." The time scale for this review shows that Phase A started approximately October 15, 1981, and should be completed by May 1, 1982. The South Texas Project is operating to the FSAR which does not contain a section describing the Quality Assurance Program for Design and Construction. To correct the present QA Program description, which is in the PSAR, a transition QA program and the final Bechtel QA program are in the planning stages for submittal to licensing. At this point in time, it was too early to determine the effectiveness of procedure implementation. This will be done on the next regular inspection. Also, a follow-up will be made on the approval of a new QA program.

2. Follow up on Four Specific Requests - All of the following requests pertain to Brown & Root, South Texas Project, deficiencies which may have to be closed by Bechtel if corrective and preventive action is not accomplished prior to program turn over.

   a. Discrepancies with the seismic qualification of cable trays and a Crane-Deming horizontal pump were identified during a VIB inspection of Corporate Consulting and Development Co., that relate to the Brown & Root/vendor interfaces. This was reported to Brown & Root (B&R) by Corporate Consulting and Development Co., Ltd., under contract to B&R.

Present status of this item could not be determined due to the transition status of the project activities.

b. Three items were reported as 10 CFR Part 21 which had previously been reported as 10 CFR 50.55(e). Final reports have been issued for the 10 CFR Part 50.55(e) item, successfully closing these items, but the 10 CFR Part 21 reports are still in process and NRC Headquarters requested the VIB to follow up on these items.

(1) Diesel Generator Fuel Oil Storage Tank Room Fan Motor Qualification.

(2) Essential Cooling Water Gantry Crane Tornado Design.

(3) Emergency Sump Recirculation Piping Overstress.

Due to the transition status of this project, this item could not be completed during this inspection.

c. Hilti Kwik-Bolt Expansion Anchors - This concerns the ability of expansion anchors (Kwik-Bolts), supplied by Hilti Industries, Inc., to meet the manufacturer's published ultimate capacity values when installed in grout. B&R reported this matter pursuant to 10 CFR Part 21 and NRC Headquarters requested the VIB to follow up on its resolution. The scheduled completion date for review of vendor pipe support designs and correction of all field installations to the revised design criteria is December 31, 1982.

d. Breakdown in the Quality Program - Procurement Cycle of Purchased Materials. This was first reported as a 10 CFR Part 50.55(e) on June 30, 1980, by Houston Lighting & Power. Previous NRC inspections of Brown & Root were conducted to review the Vendor Control Program description and implementation incorporated to resolve this quality program breakdown. The fifth interim report was issued by HL&P to the NRC in September 1981. It was not possible to determine if all necessary corrective actions will be accomplished prior to program turnover.

ORGANIZATION: BERGEN-PATERSON PIPESUPPORT CORPORATION
LACONIA, NEW HAMPSHIRE

REPORT NO.: 99900209/81-02	INSPECTION DATE(S): 11/17-19/1981	INSPECTION ON-SITE HOURS: 48

CORRESPONDENCE ADDRESS: Bergen-Paterson Pipesupport Corporation
ATTN: Mr. H. Noreen, Jr., Director
Quality Assurance and Vice President
34 Moulton Street
Laconia, New Hampshire 03246

ORGANIZATION CONTACT: Mr. H. Noreen, Jr., Director-Quality Assurance
TELEPHONE: (603) 524-1990

PRINCIPAL PRODUCT: Component Supports

NUCLEAR INDUSTRY ACTIVITY: Bergen-Paterson Pipesupport Corporation (BP) is providing component supports to approximately 22 nuclear power generating sites. Currently, approximately 50% of their work is devoted to the commercial nuclear industry.

ASSIGNED INSPECTOR: Ross L. Brown — 2/9/82
Ross L. Brown, Component Section (CS) — Date

OTHER INSPECTOR(S): W. D. Kelley, Reactive Inspection Section (RIS)

APPROVED BY: U. Potapovs — 2-10-82
U. Potapovs, Acting Chief, CS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21 and 10 CFR Part 50, Appendix B and other applicable standards.

B. SCOPE: This inspection was made at the request of the NRC senior resident inspector at the Gulf States Utilities Company, River Bend Station, Units 1 & 2, concerning the failure of ASTM A-500, Grade B material, used in the fabrication of pipesupports to meet the minimum specified tensile test elongation values when tested as part of a Stone and Webster Engineering Company confirmatory test program. Additionally, the following areas were inspected: procurement control; manufacturing process control; control of nonconformances and corrective action; 10 CFR Part 21 inspection; and status of previous inspection findings.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph NF-4231.2 of Subsection NF to Section III of the ASME Code, the following was observed with respect to Subsection NF supports (Part No. 1001, Lot Code 028957cc, Purchase Order C38349):

   a. Temporary attachments of unidentified material were welded to the parts;

   b. The qualification of the welder and welding procedure could not be established through available records;

   c. The area around the temporary attachment had not been marked so that after removal the areas could be identified;

   d. No provisions had been made on the traveler to assure that the temporary attachments had been completely removed in accordance with the procedures of NF-4211; and

   e. No provisions had been made on the traveler for the supports to be visually examined after removal of the temporary attachments.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph NCA-3820(b) of Section III of the ASME Code, purchase orders for ASTM A500, Grade B material were placed with a Material Supplier (Marmon-Keystone Corporation, Worchester, Massachusetts), who did not possess an ASME Quality System Certificate (Materials) and had not been surveyed, qualified, and audited by Bergen-Paterson.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Violation A (81-01): Posting of Section 206 of the Energy Reorganization Act of 1974, or an appropriate notice had not been accomplished.

   Review of two employee bulletin boards and review of internal audit report checklist verified compliance with the regulatory requirements.

2. (Closed) Violation B (81-01): Procedures had not been issued to provide for: (1) evaluating the deviation or informing the licensee or customer; and (2) assuring that the responsible BP officer is informed of the results of the evaluation of the problem.

   Review of the Procedure No. BP-16-1 and notice to all employees verified compliance with the regulation.

E. OTHER FINDINGS OR COMMENTS:

1. Control of Nonconformances and Corrective Action: During the review of the 1981 disposition tag log, 15 disposition tags, 10 nonconformance reports, five deviation notices and 10 corrective action reports it was possible to verify conformance with the quality assurance manual and work procedures, however, it was difficult to trace the actions taken through the various documents to determine the quality status of the deficient items/conditions. Management stated that a review would be made of this program area and necessary corrections made. A further review of this area will be made during a subsequent inspection.

2. Part 21 Inspection: Bechtel Power Corporation notified B-P of a potential problem on March 17, 1981. The suspected problem was the lack of clearance between the bracket and snubber assembly, of equipment for SNUPPS Project, Callaway Site (Bechtel P. O. No. 10466, B-P Job No. 7500). B-P management stated that testing and inspection has been performed on all types of questionable assemblies in accordance with Procedure BP-7500-S2 and the established inspection procedures, which verified that the snubber-bracket assembly will function properly with zero (0) clearance and a 12^{0} cone of action (6^{0} deflection). The results of these tests have not been published.

   B-P management stated that when the test results are published, a copy will be submitted to all applicable nuclear customers and the NRC-VIB, Region 4. The report will contain a statement that it is B-P conclusion that a safety-hazard does not exist.

   Review of the applicable procedure, instructions and actions taken by B-P verified compliance with the regulatory requirements.

3. Follow up on BP Procurement Control Practices Used For ASTM A-500, Grade B, Material

   The Stone and Webster Engineering Corporation (SWEC) Specification No. 228.310 states that the engineering and design of all ASME Code, Section III, Class 1, 2, 3 and 4 piping supports for the Gulf States Utilities Company (GSUC), River Bend Station, would be performed by SWEC, and the engineering of certain component standard supports and certain designated Code Class 4 piping would be performed by the seller. The NRC

inspector reviewed seven SWEC detail drawings for GSUC, River Bend Station, Unit 1 pipesupports and verified that the drawings specified ASTM A500, Grade B, 10" x 10" x 5/8" and 8" x 8" x 5/8" square tubing BP negotiated with Marmon-Keystone Corporation (MKC) to supply tubing of 5/8" wall thickness that would meet ASTM A-500, Grade B, requirements as permitted by paragraph 1.4 of the specification and subsequently placed orders with their Worcester, Massachusetts, warehouse. The NRC inspector reviewed three BP purchase requisitions to MKC, Worcester Massachusetts, and verified that they required; (1) manufacturer's certificate of compliance in accordance with Subsection NF-2130 of Section III to the ASME Code; and (2) a nuclear quality assurance program in accordance with BP document QA-2, "General Requirement for Seller Identification and Verification Programs for Material Suppliers." The BP QA-2 document requires the seller to survey, qualify, and audit the system program of the material manufacturers and suppliers of contracted services.

The NRC inspector verified that: (1) BP Procedure No. BP-7-3 specified that vendors who possessed a current ASME certificate appropriate to material being supplied could be placed on their approved vendor list without a physical survey of their facilities; and (2) BP performed audit of MKC's Worcester, Massachusetts, warehouse in accordance with their ASME accepted quality assurance program, when BP quality assurance became aware that this facility was not in actual possession of an ASME Quality System Certificate (Materials).

SWEC required BP initiate a verification test program of the mill test reports after the material had been received because of the known strain aging phenomenon associated with non-stablized cold formed carbon steel. The independent laboratory (Massachusetts Material Research, Inc.) reported that the tensile test elongation values of heats 950381 and 90076 were less than the 23% minimum specified by the ASTM specification for A-500, Grade B, material. The NRC inspector reviewed the mill test reports for heat 950381 from Regal Tube Company and heat 90076 from Independence Tube Corporation and verified that the reported elongation met or exceeded the ASTM specification minimum elongation.

4. Procurement Control - The NRC inspector reviewed the ASME accepted Quality Assurance Manual, customer's design specification, six customer detail drawings for pipesupports, two job requisitions, three purchase requisitions, eight test reports, two ASME Quality System Certificates, approved vendors list, and one receiving inspection report to verify that: the material was purchased from suppliers who had ASME Quality System Certificates, or who had been audited by BP QA personnel; and the material met the design document requirements. One nonconformance was identified (See paragraph B.2).

ORGANIZATION: BERGEN-PATERSON PIPESUPPORT CORPORATION
LACONIA, NEW HAMPSHIRE

REPORT NO.: 99900209/81-02	INSPECTION RESULTS:	PAGE 5 of 5

5. Manufacturing Process Control - The NRC inspector reviewed four sections of the ASME accepted Quality Assurance Manual, four procedures, and the parts identified by nine traveler packets and their associated drawings, nondestructive testing records, and welding records. One nonconformance was identified (See Paragraph B,Item 1.).

ORGANIZATION: BINGHAM-WILLAMETTE COMPANY
PORTLAND, OREGON

REPORT NO.: 99900031/81-02	INSPECTION DATE(S): 11/16-19/81	INSPECTION ON-SITE HOURS: 28

CORRESPONDENCE ADDRESS: Bingham-Willamette Company
ATTN: D. Patty
President and General Manager
2800 N. W. Front Avenue
Portland, Oregon 97210

ORGANIZATION CONTACT: O. I. Rove, Quality Assurance Manager
TELEPHONE: (503)226-5200

PRINCIPAL PRODUCT: Nuclear Pumps

NUCLEAR INDUSTRY ACTIVITY: Not obtained during this inspection.

ASSIGNED INSPECTOR: I. Barnes for H. W. Roberds, Reactive Inspection Section (RIS) — 12-30-81 Date

OTHER INSPECTOR(S): E. L. Hines, Observer

APPROVED BY: I. Barnes — I. Barnes, Chief, RIS — 12-30-81 Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B

B. SCOPE: This inspection was made as a result of: (1) the discovery of reactor coolant pump closure stud wastage due to boric acid corrosion at Oconee, Units 2 and 3; (2) the identification of a missing keyway on the shaft of a reactor coolant pump at Bellefonte, Unit 2; (3) a 10 CFR Part 50.55(e) construction deficiency report pertaining to improper fit between the impeller and shaft of a reactor coolant pump at Bellefonte, Unit 1; (4) a 10 CFR Part 21 report concerning the furnishing of an emergency feedwater pump lube oil cooler to Virgil C. Summer, Unit 1 which did not meet the design requirements of the ASME Code; and (5) the misorientation of the lubricant oil cooler on the high pressure make-up injection pumps at WPPSS-WNP 1/4.

ORGANIZATION: BINGHAM-WILLAMETTE COMPANY
PORTLAND, OREGON

REPORT NO.: 99900031/81-02	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 3 of the QA Manual, the materials list for Sales Order No. 14210471 (South Carolina Electric and Gas Company-Virgil C. Summer, Unit 1) was not prepared from the Design Specification and Code in regard to imposition of required ASME Section III Class 3 Code for the Emergency Feedwater Pump turbine lube oil cooler.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Bingham-Willamette Company (BWC) Procedure A14.0, a determination was not made, in regard to identified misorientation of lube oil cooler heads on high pressure make-up injection pumps at WPPSS-WNP 1/4, of whether similar deficiencies existed in equipment supplied to other locations.

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Follow-up Inspection on Reactor Coolant Pump Closure Studs Wastage due to Boric Acid Corrosion

   It was discovered that four closure studs on a reactor coolant pump (RCP) 2A2 at Oconee, Unit 2, had apparent corrosion wastage as a result of a small amount of leakage from the pump closure gaskets. The pump was manufactured by BWC, and as a result of this deficiency, Babcock & Wilcox in conjunction with BWC developed a RCP gasket improvement over the type 316 stainless steel that had been used on the RCP 2A2. This deficiency is not isolated to BWC in that IE Information Notice No. 80-27 identified this deficiency on pumps fabricated by other manufacturers.

2. Follow-up Inspection on the Lack of a Keyway on the Shaft of Reactor Coolant Pump 2P1A1

   As the result of a review of the documentation record packages for eight reactor coolant pumps supplied to TVA by BWC, it was discovered that some of the pump shafts may lack a floating throttle keyway. Drawing No. Z7757, Revision L of June 4, 1975, removed the keyway to accomodate a new type of seal for test and Revision N of May 3, 1976, added the keyway back to the shaft. Consequently, shafts that were machined to Drawing No. Z7757, Revision L or M, would not have the required keyway. A review of records revealed that only one shaft had been machined to Revision L or M and that was shaft SN4 HT No. 535771-3 for reactor coolant pump 2P1A1. The shaft was returned to BWC and the keyway machined on September 30, 1981.

3. 10 CFR Part 50.55(e) Construction Deficiency Report

A reactor coolant pump, 1PA2, manufactured by BWC and supplied to TVA, Bellefonte, Unit 1, had an improper fit between the shaft and the impeller. A post test inspection report of August 26, 1975, required additional clearance due to expansion and the taper of the shaft was reground and inspected as required by Engineering Rider No. 112. The surface contact of the impeller to shaft was checked in accordance with Drawing No. D 15334 but Engineering failed to require a critical dimension of the spacer to be taken to assure seating of the impeller to shaft when the pump was assembled.

4. 10 CFR Part 21 Report

On June 6, 1981, South Carolina Electric and Gas Company reported under the provisions of 10 CFR Part 21, a substantial safety hazard at Virgil C. Summer Nuclear Station, Unit 1. A turbine driven emergency feedwater pump lube oil cooler was not procured by BWC from their subvendor Terry Turbine Corp., to meet the design requirements of ASME Code, Section III, Class 3. In a service letter of July 12, 1977, from Design to Contracts it was stated that the lube oil cooler had to be fabricated to the requirements of the ASME Code, Section III, Class 3. Contracts responded by stating that the oil cooler will not be code-stamped. As a result of this correspondence the inspector presented the following questions at the exit meeting:

a. Since Design knew that the oil cooler required the quality provisions of ASME Section III, relative to temperature and pressure, why did they accept the decision of Contracts to down grade the item?

b. What are the qualifications of Contract personnel to determine the quality requirements of safety-related equipment?

c. What involvement, if any, did Quality Assurance have in this decision?

Management made no comment relative to these questions. BWC has replaced the lube oil cooler with a heat exchanger which meets all the design and Code requirements; however, they have not reviewed documentation to assure that other turbines have not been purchased with similar design deficiencies as of the date of this inspection. (See nonconformance, item B.1).

5. Follow-up Inspection of Misorientation of the Heads on Lubricant Oil Coolers

Babcock & Wilcox (B&W) notifed the NRC of a 10 CFR Part 21 report on January 9, 1981, relative to the possible misorientation of the integral heads opposite the inlet flow line on lubricant oil coolers, thus causing reduction of flow through the coolers and an attendant reduction of heat transfer. These lubricant oil coolers are an integral part of the high pressure make-up injection pumps at WPPSS-WNP 1 and 4. The subject pumps were fabricated by BWC; the lubricant oil coolers were manufactured by AMETEK, Inc.; and purchased by BWC.

BWC informed of this safety-related deficiency in a letter from B&W on January 20, 1981, and was asked to review and make a recommendation for positive alteration to the cooler head to prevent misorientation of the head during assembly. BWC Purchasing responded on May 18, 1981 (MSG No. 1952) stating that B&W had taken adequate corrective action and that hardware modifications were not necessary.

In BWC inter-office correspondence of February 27, 1981, Field Engineering Service was requested by QA to determine if other units were affected in the field and take actions to correct and mark heads to avoid mislocation during re-assembly. No actions had been taken by Field Engineering Service as of the date of this inspection. (See nonconformance, item B.2).

ORGANIZATION: BROWN BOVERI ELECTRIC, INC., DISTRIBUTION APPARATUS DIVISION
HORSHAM, PENNSYLVANIA

REPORT NO.: 99900743/81-02	INSPECTION DATE(S): 10/27-30/81	INSPECTION ON-SITE HOURS: 14.5

CORRESPONDENCE ADDRESS: Brown Boveri Electric, Inc.
Distribution Apparatus Division
ATTN: Mr. D. D. Duvall
Vice President and General Manager
Switchgear Systems Division
Norristown Road and Route 309
Spring House, PA 19477

ORGANIZATION CONTACT: Mr. E. W. Rhoads, Manager-Quality Assurance
TELEPHONE: (215) 628-7660

PRINCIPAL PRODUCT: Protective Relay Devices and Circuit Breakers

NUCLEAR INDUSTRY ACTIVITY: Did not obtain total activity during this inspection.

ASSIGNED INSPECTOR: I. Barnes for W. E. Foster, Reactive Inspection Section (RIS) — 12-18-81 Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes — I. Barnes, Chief, RIS — 12-18-81 Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B; and 10 CFR Part 21.

B. SCOPE: This inspection was made as a result of the documented notification of problems with: (1) 480 volt switchgear trip units at the V. C. Summer Nuclear Power Plant, Unit No. 1; (2) insufficient clearance of components in K-1600S and K-2000S circuit breakers at the Catawba Nuclear Power Plant, Unit Nos. 1 and 2; (3) cracking of movable arcing contacts in K-600S, K-1600S and K-2000S circuit breakers at the Catawba Nuclear Power Plant, Unit No. 2; (4) wire termination in K-600, K-1600, and possibly K-3000 circuit breakers at the Rancho Seco Nuclear Power Plant; (5) grease on contacts of 480 volt switchgear circuit breakers at the V. C. Summer Nuclear Power Plant, Unit No. 1; (6) charging spring motor wire in 480 volt circuit breakers at the San Onofre Nuclear Power Plant, Unit Nos. 2 and 3; and (7) Series ITE-50D and ITE-50H overcurrent relays supplied to numerous Nuclear Power Plants.

INSPECTION BASES AND SCOPE: (cont.)

Other areas inspected were: (1) follow up on a previously identified nonconformance; and (2) follow up on a previously identified unresolved item.

A. VIOLATIONS:

None

B. NONCONFORMANCE:

Contrary to Brown Boveri Electric, Incorporated, Switchgear Systems Division's corrective action response letter dated April 8, 1981, the revised organization chart had not become effective April 1, 1981; as evidenced by an undated organization chart incorporated into the QA Manual and QA Procedure. The incorporated organization chart does not depict a block identified as "Final Test," as depicted in the chart provided with the corrective action response letter.

C. UNRESOLVED ITEMS:

Follow up on Regional Requests - The NRC inspector observed that the movable control contact assembly (control block) touches, or very nearly touches, the surface of the ball-bearing conveyor as the K-1600S circuit breaker is hoisted from its handling carriage to facilitate preparation for shipment. If touching does occur, dependent upon the force of contact, breakage of the movable control contact assembly could result.

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Nonconformance (81-01): Personnel performing quality assurance functions did not have the organizational freedom from cost and schedule, inasmuch as they reported directly to manufacturing management and not to the QA Manager.

   The NRC inspector verified that a revised organization chart depicts personnel reporting directly to the QA Manager. However, the chart differs from the one supplied with the corrective action response letter inasmuch as it did not depict a block identified as "Final Test."

2. (Resolved) Unresolved Item (81-01): It was not apparent to the NRC inspector that identification of purchased parts was accomplished at receiving inspection.

Interview with the Receiving Inspector provided assurance that identification of purchased parts is accomplished. Further, the Quality Assurance Manager, Switchgear Systems Division, assured the NRC inspector that a characteristic for identification would be added to the Inspection Record Card.

E. OTHER FINDINGS OR COMMENTS:

1. Follow up on Regional Requests

a. The defective 480 volt switchgear trip units, Serial Nos. 34049 and 32385 were tested upon receipt from South Carolina Electric and Gas Company. Both tested satisfactorily. Upon disassembly, the latter revealed slight damage that had no effect upon its function; however, the former exhibited broken solder connections on the long time and short time printed circuit boards, which were repaired. The entire control board of the latter unit was replaced as a precautionary measure. Both were returned to South Carolina Electric and Gas Company.

Corrective measures were adequate and preventive measures were not required inasmuch as it appears that the damage occurred after initial delivery of the units.

b. Duke Power Company reported that a clearance problem existed between the: (1) magnetic latch lever and the right pole current sensor coil; and (2) current sensor coil and the lower terminal current stud directly behind it. This was observed in some K-1600S and K-2000S circuit breakers at the Catawba Nuclear Station, Unit Nos. 1 and 2. The second problem appears to be restricted to the K-2000S circuit breaker. Corrective actions include: (1) modification of magnetic latch levers; and (2) addition of insulating tape between the current sensor coil and the lower terminal current stud directly behind it. Instructions for accomplishment of this activity were distributed in October 1981, to all purchasers that have K-1600S and K-2000S circuit breakers, delivered prior to June 1981. Preventive measures include: (1) revision of drawings for the magnetic latch lever and current sensor; and (2) revision of assembly and inspection procedures. Corrective actions and preventive measures are adequate.

c. Duke Power Company reported the following problems related to K-600S, K-1600S and K-2000S circuit breakers located at Catawba Nuclear Station, Unit Nos. 1 and 2: (1) several moving arcing contacts were found cracked during initial inspection; and (2) some secondary control blocks were found broken when uncrated.

Reviewed records indicate that there was an awareness in early 1979 of cracking arcing contacts, movable and stationary. Further, interviews indicated that there was an awareness in 1978.

An evaluation was conducted in 1979 to determine the effect cracked arcing contacts had upon the life of the K-1600 circuit breaker. The report provided the following conclusion: "The contacts did not crack during circuit breaker operation unless they were pre-cracked. When cracks existed, they migrated and became larger, but did not separate or fall off the assembly." As a result of the investigation, it was recommended that the K-1600 circuit breakers supplied for Susquehanna Steam Electric Station be inspected for cracks and cracked contact assemblies be replaced. Preventive measures were taken with the supplier of the contacts who reportedly, modified his procedures. The circuit breakers were supplied on a purchase order (Bechtel Power Corp. No. 8856-E-117-AC, Rev. 11, dated March 6, 1978) which invoked 10 CFR Part 21; however, the supplier of the circuit breakers determined the defect non-reportable.

Defective arcing contact assemblies from Catawba Nuclear Station are in the process of being returned to Brown Boveri Electric for rework. Contacts are no longer purchased as separate items to be brazed onto the next assembly; rather, arcing contact arm assemblies are purchased. Broken control blocks were also observed in 1979. It was determined that breakage occurred during shipping and improved packing was instituted. As with the arcing contacts, broken control blocks are being replaced for Catawba Nuclear Station. The NRC inspector observed the handling procedure for a K-1600S circuit breaker during preparation for shipment and questions the adequacy of the preventive measures.

d. South Carolina Electric and Gas Company reported that grease was on contacts of 480 volt switchgear circuit breakers received from the manufacturer. Prior to the inspection, the NRC inspector contacted the Inspection and Enforcement Office, Region II to determine what reports were available. The NRC inspector was informed that this item was closed; however, he elected to verify that lubrication was a controlled activity at the manufacturing facility. No problems were observed.

e. Bechtel Power Corporation, Norwalk, California, reported that the insulation had worn away on the wire to the charging spring motor resulting in a grounded condition of the 480 volt load center switchgear. This condition was observed at the San Onofre Nuclear

Generating Station, Unit Nos. 2 and 3. Corrective action taken was securing the wire to the frame of the circuit breaker with tie wrap; this applied to all delivered hardware manufactured prior to May 1981. Preventive measures include: (1) keeping the wire encased in spiral wrap until it has passed the point of interference with the racking gear; and (2) 100 percent inspection for compliance with this requirement.

2. Follow up on IE Information Notice No. 81-06:

The notice addressed the incompatibility of a conductor/lug combination on the shunt trip device of a K-600 circuit breaker located at the Rancho Seco Nuclear Station. Corrective Action is being initiated by Rancho Seco.

The NRC inspector was informed that numerous customers had contacted Brown Boveri Electric and none have experienced the problem. The NRC inspector reviewed the assembly and inspection procedures and observed terminal lugs at the wiring station, all appeared satisfactory.

3. Follow up on 10 CFR Part 21 Reports:

Brown Boveri Electric, Inc., Switchgear Systems Division, filed a 10 CFR Part 21 report regarding a potential problem with Series ITE-50D and ITE-50H overcurrent relays. The potential problem was identified as failure of the relay to drop out when its input current drops below 98 percent of the pick up setting. The cause has been identified as an integrated circuit on the drawout printed circuit board. Progress is underway in modifying the printed circuit boards of delivered relays. To prevent recurrence, drawings have been revised to incorporate a more reliable integrated circuit. The inspector observed that boards are being manufactured with the more reliable integrated circuit.

ORGANIZATION: COMBUSTION ENGINEERING, INC.
POWER SYSTEM GROUP
WINDSOR, CONNECTICUT

REPORT NO.: 99900002/82-01	INSPECTION DATE(S): 1/18-22/82	INSPECTION ON-SITE HOURS: 28

CORRESPONDENCE ADDRESS: Combustion Engineering, Inc.
Power Systems Group
ATTN: Mr. H. V. Lichenberger
Vice President - Manufacturing
1000 Prospect Hill Road
Windsor, Connecticut
ORGANIZATIONAL CONTACT: Mr. M. R. Thomas, Quality Assurance Manager
TELEPHONE NUMBER: (203)688-1911 ext. 5774

PRINCIPAL PRODUCT: Nuclear fuel assemblies and control rod drives.

NUCLEAR INDUSTRY ACTIVITY: Nuclear fuel and control rod drive supplier for CE design cores.

ASSIGNED INSPECTOR: W. M. McNeill 3/5/82
W. M. McNeill, Reactive & Components Program Section (R&CPS) Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes 3/5/82
I. Barnes, Chief, R&CPS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR 50, Appendix B.

B. SCOPE: Procurement controls; enrichment and impurity controls; hydrogen controls; control of special processes and status of previous inspection findings.

PLANT SITE APPLICABILITY

Not identified.

ORGANIZATION: COMBUSTION ENGINEERING, INC.
POWER SYSTEMS GROUP
WINDSOR, CONNECTICUT

REPORT NO.: 99900002/82-01	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCE:

1. Contrary to Operation Sheet 1489, paragraph 4.2, and Criterion V of Appendix B to 10 CFR Part 50, duplicate boat numbers and four tray numbers missing from the dimensional inspection records were found in a lot of pellets being processed.

2. Contrary to the East Windsor QA Manual, Section 4.5.1 and Criterion V of Appendix B to 10 CFR Part 50, work was being performed to a specification revision which was not included in the Manufacturing Order.

3. Contrary to the East Windsor QA Manual Section 6.5.3 and Criterion V of Appendix B to 10 CFR 50, a review of 10 Personnel Qualification records found records issued in 1980 and 1981 stated two persons had been qualified to SNT-TC-1A revisions other than specified in the Manual. SN-TC-1A (1975) was specified, but records indicated qualification to SNT-TC-1A (1969) and SNT-TC-1A (1980).

C. UNRESOLVED ITEMS:

None

D. STATUS of PREVIOUS INSPECTION FINDINGS:

(Closed) Nonconformance (81-02): Some procedures were not controlled. Instructions have been issued on the control of the procedures in question. A review of current procedures for welding and weld repair found no further problems.

(Closed) Nonconformance (81-02): Audit problems were not identified as "findings" or "recommendations." A review of current audits found no additional problems.

(Closed) Nonconformance (81-02): Not all nonconformances identified on DN's were summarized on a weekly basis. The QA Manual is being revised in this area. The Manual is due to be issued at the end of February. The draft manual allows the filtering of nonconformances such that significant trends only are reported in summaries.

ORGANIZATION: COMBUSTION ENGINEERING, INC.
POWER SYSTEM GROUP
WINDSOR, CONNECTICUT

REPORT NO.: 99900002/82-01	INSPECTION RESULTS:	PAGE 3 of 3

E. OTHER FINDINGS OR COMMENTS:

1. Procurement Controls - A review of procurement documents for fuel cladding was performed. Supplier evaluation and review was performed as required by procedures. The procurement documents, P.O., subvendor procedures, etc., were found to be given a review by Combustion Engineering. Source inspection performed on recent lots was reviewed with the vendor certifications for the lots.

2. Hydrogen, Enrichment and Impurity Controls - The compliance of fuel pellet manufacture to product specifications was verified. The established processes were reviewed with their controls and sampling plans. The hydrogen testing and drying of a lot of pellets was witnessed. The records of sampling of a lot for chemistry testing were checked. In this area a nonconformance was identified. A large sample of pellets for dimensional and chemistry testing is made by drawing a few pellets from each tray in a lot. In the nonconformance cited the sample reflected that all trays had not been included. The lot sample size drawn is in excess of the requirements necessary to accept a lot. This inspection included a review of the administrative controls, color codes, etc., of enrichments. Chemistry testing results and lot certification were inspected on recent lots.

3. Control of Special Processes - this part of the inspection was performed at the East Windsor ASME Code shop where Control Element Drive Mechanisms are fabricated. Liquid penetrant testing was the subject of inspection. A liquid penetrant test of the weld of a lower end fitting to upper pressure housing was witnessed. The compliance to procedures on testing and qualifications was verified. It was noted that personnel were qualified but the reports were not consistent with the QA Manual requirement. This was identified as a nonconformance. SNT-TC-1A (1980) has yet to be accepted by the ASME Code. SNT-TC-1A (1968) differs slightly from SNT-TC-1A (1975) on training and experience requirements for qualification. In review of the Manufacturing Order and the technical requirements it was noted that the project specification being followed was not the same as that identified in the Manufacturing Order. Revision level 0 was included in the Manufacturing Order and had exceptions taken to it by Combustion Engineering. Revision 1 was issued based on the exceptions and accepted by the customer. Revision 1 has not been included in the Manufacturing Order. This was identified as a nonconformance.

ORGANIZATION: COMBUSTION ENGINEERING, INC., POWER SYSTEMS GROUP
WINDSOR, CONNECTICUT

REPORT NO.: 99900401/81-03	INSPECTION DATE(S): 11/2-6/81	INSPECTION ON-SITE HOURS: 87

CORRESPONDENCE ADDRESS: Combustion Engineering, Inc.
Power Systems Group
ATTN: Mr. M. R. Etheridge
Vice President, General Services
1000 Prospect Hill Road
Windsor, CT 06095

ORGANIZATION CONTACT: Mr. C. W. Hoffman, Director, Group QA
TELEPHONE: (203) 688-1911

PRINCIPAL PRODUCT: Nuclear Steam Supply Systems

NUCLEAR INDUSTRY ACTIVITY: The Power Systems Group of Combustion Engineering (CE) has contracts for 26 of the domestic reactor units to date, of which 18 are in the design and construction phase. In addition, they have modification/repair/service contracts for 26 reactor units.

ASSIGNED INSPECTOR: R. H. Brickley — 12/18/81
R. H. Brickley, Reactor Systems Section (RSS) Date

OTHER INSPECTOR(S): L. E. Ellershaw, Reactive Inspection Section (RIS)
I. Barnes, Chief, RIS

APPROVED BY: C. J. Hale — 12-22-81
C. J. Hale, Chief, RSS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and Topical Report CENPD-210-A.

B. SCOPE: This inspection was made in response to a request from Region V of the Nuclear Regulatory Commission for evaluation of the effectiveness of the Combustion Engineering, Inc. (CE) vendor surveillance program. This request was made as a result of several defective safety-related components being furnished by subcontractors of CE to Washington Public Power Supply System Nuclear Projects 3/5. Areas selected for inspection to evaluate vendor surveillance program effectiveness were procurement document control, evaluation of supplier performance, verification activities, product acceptance, and supplier nonconformance and corrective action. The inspection additionally included action on previous inspection findings.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Section 17.10 of Topical Report CENPD-210-A, certain operations, designated on the IMQP as being mandatory hold points, were performed by the supplier without evidence of either the PSG representative being present or written waiver; e.g., 11 of 12 liquid penetrant examinations of tube welds; 2 of 12 tubeside hydro-tests; and 2 of 12 shellside hydro-tests. This pertains to 12 Component Cooling Water Heat Exchangers (CCWHE) provided to TVA's Yellow Creek Nuclear Plant, Units 1 and 2.

2. Contrary to Section 17.7.2 of Topical Report CENPD-210-A and Procedure QAP 17.2, paragraph 4.1.4, a review of the records checklists (RCL) and documentation packages for the 12 CCWHEs showed the following:

   a. The required weld material certification review was shown as having been performed by GQC for only 2 of 12 RCLs.

   b. None of the documentation packages contained the required material test reports of the filler metal used in the tube to tubesheet welds.

   c. Radiographs denoted by the RCLs as being required for six of the CCWHEs were not available.

   d. Four welding procedure specifications, their qualifications, and welder qualifications were not on file, as required by all 12 RCLs.

3. Contrary to Section 17.18 of Topical Report CENPD-210-A and Procedure QAP 18.2, manufacturing processes used by Joseph Oat Corporation during the fabrication of 12 CCWHEs for Yellow Creek, Units 1 and 2, were not considered by the cognizant supervisor in selection of priority basis in-process audits, as evidenced by review of Vendor Surveillance Audit Forms and Surveillance Reports. These surveillance documents indicated that no in-process audits were performed during the fabrication of the CCWHEs in regard to the welding processes used; i.e., shielded metal arc, gas tungsten arc, and submerged arc welding.

4. Contrary to Section 17.9 of Topical Report CENPD-210-A, GQC surveillance or record review has not verified completion or fulfillment of Code Special process requirements by external suppliers, as evidenced by the following examples:

   a. Shutdown heat exchangers were completed and shipped by the Schutte & Koerting Division of Ametek, Inc., to WPPSS- WNP 3/5, Duke Power Company Cherokee, Unit 1, and TVA Yellow Creek, Units 1 ans 2, without identification by GQC that required qualification of forming processes had not been performed. Similarly, component cooling water heat exchangers were shipped by the Jospeh Oat Corporation to TVA Yellow Creek without

identification by GQC that required forming process qualification records were not available for review.

b. TVA Yellow Creek component cooling water heat exchangers were furnished by Jospeh Oat Corporation without verification by GQC that a qualified welding procedure specification (WPS) had been used for tube to tube-sheet welding. Review of the documentation packages showed that the identity of the applicable WPS had not been included as required. It was additionally noted that a WPS for this activity and supporting procedure qualification record (PQR) had never been submitted to CE for review and approval, although this was a requirement of the contract imposed by TVA Specification No. 1915. For the same contract, WPS Nos. 8, 16, and 45 were identified in the documentation packages as having been used, but these WPSs and PQRs had also not received the required review and approval by CE.

c. Examination of the documentation packages furnished by the Schutte & Koerting Division of Ametek, Inc., for the WPPSS-WNP 3 and Duke Cherokee 1 shutdown heat exchangers showed that GQC review prior to initial shipment had failed to identify that submerged arc welding material certification was incomplete with respect to required Charpy-V impact test results. Similarly, the documentation packages which had been prepared for the WPPSS-WNP 3 shutdown heat exchangers after return and completion of repair operations, showed incomplete certification with respect to Charpy-V impact properties for SFA 5.20 E70T-2 welding materials that had been used in nozzle to channel pressure boundary welds.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Open) Nonconformance (81-02): Quality Assurance of Design Procedures (QADP) do not address implementation of Section 9 (Corrective Action) of ANSI N45.2.11-1974.

   QADP 5.7 (Design Change, Field Change, Corrective Action) was revised on October 15, 1981, to implement Section 9 of ANSI N45.2.11-1974. Since the completion date for documentation of required training is November 15, 1981, this item was not examined.

2. (Closed) Nonconformance (81-02): A CE internal audit disclosed a nonconformance, but the cause and effect were not identified and the extent of the corrective action required was not determined.

   The CE internal audit indicated this was an isolated case of improper application of Quality Assurance Procedures (one case in a sample of 30). The two orders shipped were investigated and active orders at the manufacturers were placed on hold. Procurement requirements were resolved, a follow up survey performed, and the supplier to 00000 WQC 11.1, Rev. D.

E. OTHER FINDINGS OR COMMENTS:

1. Supplier Nonconformance and Corrective Action (R. H. Brickley): Applicable procedures from the Group Quality Assurance Manual and the Quality Assurance of Design Procedures Manual were examined to determine that procedures have been prepared and approved consistent with QA program commitments. Thirty Deviation from Contract Requirements (DCR) documents involving 3 suppliers and 6 plants, and 12 Corrective Action Reports (CAR) involving 8 suppliers were examined to determine that these procedures were being implemented. In the areas inspected, no nonconformances were identified.

2. Procurement Document Control (L. E. Ellershaw): This area of the inspection was reviewed by examination of Quality Assurance Program requirements, implementing procedures, TVA's contract with CE for 12 CCWHEs including the equipment specification, 2 CE purchase orders and their revisions placed with Joseph Oat Corporation, the CCWHE manufacturer, and CEs project specification for CCWHEs. The review was made to assure that the requirements placed on CE were passed on to their suppliers in the procurement documents and that the procurement documents were reviewed and approved by CE's quality assurance organization.

3. Evaluation of Supplier Performance (L. E. Ellershaw): This area of the inspection was reviewed to determine that a system has been prescribed for evaluation of supplier performance which is consistent with the commitments of the QA Program, and that the system has been implemented. This review was performed by examining CE's records of 27 supplier audits, 22 surveillance reports, 12 records checklists and documentation packages, 6 requests for approval or review related to special processes, deviation from contract requirements, the integrated manufacturing quality plans, and 6 supplier drawings, all pertaining to the 12 CCWHEs manufactured by Joseph Oat Corporation. As a result of this review, nonconformances B.1, B.2, and B.3 were identified.

   In regard to Nonconformance B.3, the following information should be noted:

   a. The Special process "Weld Control" was shown to have been audited once by CE on September 19, 1978, which was the initial fabrication date for rolling the shell plates. It was determined that only tack welding was performed at that time. The total CE report of this audit is as follows: "Review documentation relating to welder qualifications, and equipment calibration records." There were no additional audits of "weld control" performed until May 6, 1981, which was 3 weeks after the shipping release for the last of the 12 CCWHEs. (In light of the brevity of the audit report quoted above, in its entirety, future inspections will consider CE's committed content for such reports).

   b. Audits of 4 of the 18 Appendix B criteria were not performed at the supplier's facility by GQA until after all 12 CCWHEs had been supplied.

   c. Audits of 10 of the 18 Appendix B criteria were not performed at the supplier's facility by GQA until after 7 CCWHEs had been shipped.

ORGANIZATION: COMBUSTION ENGINEERING, INC., POWER SYSTEMS GROUP
WINDSOR, CONNECTICUT

REPORT NO.: 99900401/81-03	INSPECTION RESULTS:	PAGE 5 of 5

4. Product Acceptance and Verification Activities (I. Barnes): An integrated inspection was performed of product acceptance and verification activities, in order to ascertain that system procedures had been prepared and implemented in accordance with the QA Program commitments. The inspection was accomplished by review of applicable QA program procedures and examination of surveillance records for four CE vendors, integrated manufacturing quality plans, records checklists and documentation packages for a specific heat exchanger, and tank and gas stripper procurements. Nonconformance B.4 was identified in this review.

ORGANIZATION: EDS NUCLEAR, INCORPORATED
SAN FRANCISCO, CALIFORNIA

REPORT NO.: 99900528/82-01	INSPECTION DATE(S): 1/4-7/82	INSPECTION ON-SITE HOURS: 106

CORRESPONDENCE ADDRESS: EDS Nuclear, Incorporated
ATTN: Mr. L. W. Cooley
Vice President
220 Montgomery Street
San Francisco, CA 94104

ORGANIZATIONAL CONTACT: Mr. R. A. Ayres, QA Manager
TELEPHONE NUMBER: (415) 544-8050

PRINCIPAL PRODUCT: Engineering Consultant Services

NUCLEAR INDUSTRY ACTIVITY: EDS Nuclear, Inc., has 55 contracts involving approximately 49 domestic reactor units for consulting services such as engineering analysis, equipment qualification, licensing assistance, pipe support design, pipe whip analysis and protection design, piping analysis, seismic analysis, and safety analysis.

ASSIGNED INSPECTOR: T. H. Brickley — 2/11/82
R. H. Brickley, Reactor Systems Section (RSS) — Date

OTHER INSPECTOR(S): D. G. Breaux, RSS
I. T. Yin, RIII
D. H. Danielson, RIII

APPROVED BY: C. J. Hale — 2-11-82
C. J. Hale, Chief, RSS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made as a result of: (1) the issuance of a 10 CFR Part 50.55(e) report by Texas Utilities Generating Co., concerning the use of Operational Base Earthquake rather than Safe Shutdown Earthquake loads by EDS Nuclear, Inc., in developing tubing support criteria for Comanche Peak; and (2) a Licensee Event Report by Commonwealth Edison Co., concerning
(Cont. on next page)

PLANT SITE APPLICABILITY:

The information contained in paragraphs E.1 and E.3 is applicable to docket nos. 50-445 and 50-237.

ORGANIZATION: EDS NUCLEAR, INCORPORATED
SAN FRANCISCO, CALIFORNIA

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SCOPE: (Cont.). water hammer in the high pressure coolant injection (HPCI) and component cooling service water systems (CCWS) at Dresden 2. An assessment of the EDS QA program was made also.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

(Closed) Nonconformance (81-01): Project Instructions contained conflicting design acceptance criteria, did not reflect the latest NRC accepted operability stress limits, and did not provide guidance on use of the Blume Curves.

Project Instructions were revised to correct the procedural deficiencies identified.

E. OTHER FINDINGS OR COMMENTS:

1. Erroneous criteria used in calculating seismic loads on instrument tube supports (R. H. Brickley) - This item, reported to RIV via 10 CFR Part 50.55(e) Report by Texas Utilities Generating Co. (TUGCO), concerned the use of Operating Bases Earthquake (OBE) rather than Safe Shutdown Earthquake (SSE) loads by EDS Nuclear, Inc., in developing tubing support criteria for Comanche Peak (CPSES).

   From the records examined at both EDS and CPSES, it was determined that the development of the tubing support criteria was conducted under a non-safety related TUGCO purchase order (PO No. CPD-0254 dated June 27, 1979). In fact, a TUGCO memo of June 11, 1979, requesting that the purchase order be issued, stated, " . . . not safety related." Reportedly, the EDS engineer involved received verbal instructions from TUGCO regarding these criteria and understood that they were to be used on miscellaneous tubing that were not safety related. The statement made on the TUGCO memo of June 11, 1979, and the lack of specific documented requirements for this project in either the TUGCO or EDS files, appears to substantiate the engineer's understanding of the intended application of these criteria. It was further noted that neither 10 CFR Part 50, Appendix B, nor 10 CFR Part 21 requirements were imposed by TUGCO purchase order No. CPD-0254.

ORGANIZATION: EDS NUCLEAR, INCORPORATED
SAN FRANCISCO, CALIFORNIA

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However, it should be noted that an EDS Job Requisition dated July 1, 1979, for Job No. 0210-010-241 (Tubing Support Criteria), required that these activities be conducted in accordance with their QA program.

An EDS Record of Conversation (ROC) dated March 23, 1981, between EDS and TUGCO personnel was the first documented indication that a problem existed. The telecon was made by EDS to discuss the fact that the TUSI Tubing Support Criteria provide support loads which are OBE and not SSE. The criteria imply that the loads are SSE by the statement in Appendix A that the loads are "maximum expected loads" which are "generated in worst case conditions." This ROC indicated that the overall concern was that some supports and associated Hilti bolts may be underdesigned for the number of tubes allowed on some design typicals. EDS suggested that they determine new design loads with SSE loads and telecopy them to TUGCO so that they can review the design typicals and bolt loads.

On June 22-23, 1981, TUGCO conducted their first pre-award survey of EDS and on July 8, 1981, issued purchase order no. CPF-594-S which classified the work as safety related and imposed the requirements of 10 CFR Part 50, Appendix B, and 10 CFR Part 21.

Based on the above data, it is concluded that problem resulted from: (1) informal/undocumented instructions to EDS regarding the requirements and intended application of the criteria; (2) an ambiguous statement in Appendix A of the loading criteria that led one to believe that they were based on SSE; and (3) a misapplication of the criteria on safety related tubing.

Corrective actions completed or in progress include issuance of Revision 2 of the Tubing Support Criteria clarifying Appendix A criteria, issuance of a new purchase order (CPF-594-S) providing specific criteria and requirements to EDS, and the evaluation and revision of support design at CPSES.

There were no violations, nonconformances, or unresolved items identified in this area.

2. QA Program Assessment (D. G. Breaux) - The EDS Nuclear Quality Assurance Manual and applicable procedures were reviewed for consistency with quality and technical commitments to codes, standards, regulations, and guides. To determine that the necessary organization, facilities, and procedures for properly implementing the QA program to assure the production of a quality product, the inspector examined the following documents: 10 engineer and auditor qualifications documentation, 3 internal

ORGANIZATION: EDS NUCLEAR, INCORPORATED
SAN FRANCISCO, CALIFORNIA

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QA audits, 6 Engineering Design Reviews, 3 calculation files, 4 drawings with their subsequent revisions, 6 project QA files, and Records Center Storage input. From this review the QA program is consistently defined and implemented with respect to the committed codes, standards, and guides.

3. Water hammer problems in the HPCI and CCWS systems at Dresden 2 (I. T. Yin) - In review of CECO and EDS actions relative to the HPCI suspension system damage problems, the inspector determined:

   a. The added drain line was considered to be acceptable.

   b. System evaluation per IEB 79-14 evaluation appeared to be in order.

   c. Fatigue analysis did not include one additional damaged pipe rupture restraint on one damaged sway brace.

   d. Gap measurements for the pipe rupture restraints were not conducted in accordance with the established field inspection procedure.

   In review of CECO and EDS actions relative to the CCWS suspension system damage problems, the following items were identified:

   a. Excessive gap openings were observed at the seismic restraints. EDS analysis modeled these restraints as rigid members without justification of the effects of mechanical loss of motion during vibratory conditions.

   b. Fatigue analysis was in the preparation stage. The inspector commented that: (1) methodology was considered to be correct; (2) all failure conditions had not been included in the analysis; and (3) failure mode and bolt load assumptions were not considered to be conservative.

   c. Fluid dynamic analysis will be performed to determine the effects of check valve slamming that could have caused one restraint failure in the system.

   NOTE: The concerns identified above will provide the bases for findings in a RIII report to the licensee, CECO (Report Nos. 50-237/82-01, 50-249/82-01).

ORGANIZATION: EBASCO SERVICES, INC.
NEW YORK, NEW YORK

REPORT NO.: 99900505/82-01	INSPECTION DATE(S): 1/11-15/82	INSPECTION ON-SITE HOURS: 120

CORRESPONDENCE ADDRESS: Ebasco Services, Inc.
ATTN: Mr. B. E. Tenzer, Vice President
Materials Engineering and Quality Assurance
Two World Trade Center
New York, NY 10048

ORGANIZATIONAL CONTACT: B. R. Mazo, Chief Quality Assurance Engineer
TELEPHONE NUMBER: (212) 839-2830

PRINCIPAL PRODUCT: Architect Engineering Services

NUCLEAR INDUSTRY ACTIVITY: The total effort committed to domestic nuclear activities is approximately 50% of a 5,000 person staff. Major projects include Shearon Harris, Units 1 through 4; St. Lucie, Unit 2; Waterford, Unit 3; WPPSS, Units 3 and 5; and Allens Creek, Unit 1. There are also modification/repair/service contracts on ten additional reactor units.

ASSIGNED INSPECTOR: J. R. Costello — 2/11/82
J. R. Costello, Reactor Systems Section (RSS) — Date

OTHER INSPECTOR(S): D. F. Fox, RSS; C. J. Hale, RSS; M. W. Peranich, V&SPB/IE; A. Garland, IAEA (Observer); F. Vasquez, CNSNS (Observer); J. Taylor, RP/IE (Observer)

APPROVED BY: C. J. Hale — 2-11-82
C. J. Hale, Chief, RSS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B, and Topical Report No. ETR-1001.

B. SCOPE: This inspection was made for two principal purposes: (1) to assess the effectiveness of Ebasco's system for design verfication by in-depth design reviews of specific safety-related systems on two active projects, Shearon Harris and Washington Nuclear Plants (WNP) 3 and 5; and (2) to verify compliance to design requirements of parallel slide gate valves procured by Ebasco from Atwood Morrill and fabricated by Hopkinsons Ltd. for use at WNP 3 and 5.

PLANT SITE APPLICABILITY:

The contents of this report relate to the following dockets: 50-400, paragraph D.1; and 50-508, paragraphs D.2 and D.3.

ORGANIZATION: EBASCO SERVICES, INC.
NEW YORK, NEW YORK

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A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Design Inspection (Shearon Harris Unit 1) - The Ebasco Topical Report ETR-1001 and applicable procedures were reviewed to establish quality assurance program commitments. Section 6.2.2 (Containment Heat Removal System) and 6.5.2 (Containment Spray System) of the Shearon Harris PSAR were reviewed and selected design inputs were picked. The selected design inputs were then traced through the design process to the final output documents to verify that the design process had been correctly implemented. Concurrent with this verification, the effectiveness of Ebasco's design verification methods was assessed.

   The following documents were examined to assess the effectiveness of the Ebasco design verification process: 2 design request memos, 2 calculations, 1 electrical design criteria document, 4 specifications and 26 drawings.

   In the documents examined, no nonconformances or unresolved items were identified. However, three items of concern were identified and will be further reviewed during future inspections. First, the amount of documentation retained by the design verifier makes it difficult, in some cases, to determine the methodology used by the design verifier. Second, the method of design verification is not uniform throughout the design disciplines; e.g., the electrical discipline does not permit the designer draftsman to perform design verification while other design disciplines do. Third, design verification, in some disciplines, is done by supervisors, which can raise questions about true independence.

2. Design Inspection (WNP 3/5 Project) - Sections of the Washington Public Power Supply System (WPPSS) Unit 3 PSAR and draft FSAR pertaining to the containment spray system (CSS), and applicable design control procedures were reviewed to determine the commitments and requirements for the CSS and to check if design inputs of the CSS were identified, appropriate,

ORGANIZATION: EBASCO SERVICES, INC.
NEW YORK, NEW YORK

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documented, and approved. Selected CSS intermediate and final design documents, such as calculations, specifications, and drawings, were examined in concert with an ad hoc multidisciplined group designated by Ebasco management to participate in a limited scope design review of the CSS, to determine if the final design was traceable to, and met, the approved design inputs and performance requirements.

The group addressed approximately 160 questions related to regulatory and ASME Code requirements, pre- and post-accident containment environmental conditions, functions and performance requirements of the CSS, and five major components of the CSS that were identified by the NRC inspector. Within the areas examined, no significant design deficiencies nor failure to implement commitments were identified.

However, the NRC inspector noted that:

a. The interpretation and extent of independent design verification does not appear to be consistent within the WNP-3/5 project in that the I&C group performs a documented independent design verification of each design using an I&C engineer, who was not the originator of the design, in addition to a design verification by the supervising engineer as permitted by Ebasco procedure E-76. In contrast, the mechanical group apparently does not document their independent design verification at the engineering level.

b. The Ebasco procedure for design verification (E-76) permits the use of a supervisory engineer to act as the independent design verifier under certain conditions. Inconsistencies with respect to the safety relief valve for the sodium hydroxide tank between early and later revisions of the CSS flow diagram (WPPSS-3240-G-1070) and the associated safety relief valve specification (WPPSS Specification 3240-91), and the apparent lack of calculations or other documentation to support the currently specified relieving capacity of the valve, generates a concern that in some cases, the supervisor may not have sufficient time to conduct a thorough and objective verification of design adequacy.

3. Parallel Slide Gate Valve Design Compliance - The parallel slide, or double gate, valve is used in numerous applications on the WNP 3 & 5 units. This area of the inspection was to verify compliance to design requirements for valve body overpressurization protection, seismic qualification, and material control. A 12" valve for use in the containment spray system was used as a typical example for the purposes of this inspection.

ORGANIZATION: EBASCO SERVICES, INC.
NEW YORK, NEW YORK

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The subject valve (Ebasco drawing no. 3240-16562) has three 3/4" Schedule 80 pipes, up to 12.5" in length, welded to the valve body. These three pipes provide the following features: (1) "Pressure Relief Connection"-a pipe with welded plug near the bottom of the valve body to be used for periodic flushing of the valve body; (2) "Blowout Connection"-a pipe located between the Stellite faced backseat and stem packing for ease of removal of packing for maintenance; and (3) "Leak-off Connection"-a pipe located between the double packing in the stem to monitor the packing integrity.

Valve body overpressurization protection is provided in the valve-closed position by a balance valve installed at the centerline of the valve with welded pipe communicating the valve body with the high pressure side of the valve inlet. In the valve-open position the valve body communicates directly with the line pressure.

Seismic qualification of these type valves by analysis and prototype tests was required. The seismic analysis by Hopkinsons (Design Report No. 34) was reviewed for the subject valve which included the three pipe connections and the balance valve. The prototype seismic (vibration) tests were performed on the subject valve by American Environmental Labs in accordance with Atwood Morrill specification 556-14215-00. The test results had not been received by Ebasco, as yet, and according to Ebasco Expediting Report No. 32, tests of the remaining typical valves would not be completed until the Spring of 1982.

The remaining piping for the "Blowout" and "Leak-Off" connections will completed at the WNP site. According to the applicant's letter, PFA-35-81-108, the "Blowout Connection" will be sealed with a welded plug. Ebasco drawing no. 3240-G-1096 is a typical for leak-off piping and applies to the subject "Leak-Off Connection." The design and analysis of this piping will be performed by Ebasco site personnel.

Ebasco specification 3240-41J requires all stainless steel used in these valves to be solution annealed; however, Material Certs are not sent to Ebasco's New York office and, therefore, could not be reviewed during this inspection. Welding procedure specification N6-61 for socket and end cap butt welds in stainless steel was reviewed for compliance with Section IX and applicable parts of Section III of the ASME Code.

No nonconformances were identified in this area of the inspection. The subject valve drawing from the vendor was not a legible reproducible; however, Ebasco had initiated action to obtain one from the vendor.

ORGANIZATION: EXIDE CORPORATION
SUMTER, SOUTH CAROLINA

REPORT NO.: 99900360/81-01	INSPECTION DATE(S): 12/8-11/81	INSPECTION ON-SITE HOURS: 25

CORRESPONDENCE ADDRESS: Exide Corporation
ATTN: Mr. Charles Reichart
Contracts Administrator
101 Gibraltar Road
Horsham, PA 19044

ORGANIZATION CONTACT: Mr. Mark Knechtel, Plant QC Manager
TELEPHONE: (803) 481-8511

PRINCIPAL PRODUCT: Lead Acid Batteries

NUCLEAR INDUSTRY ACTIVITY: The nuclear output of the Exide Corporation including the Sumter, South Carolina plant and the Richmond, Kentucky plant is 2%, based on sales.

ASSIGNED INSPECTOR: R. E. Oller — 1-25-82
R. E. Oller, Components Section (CS) — Date

OTHER INSPECTOR(S):

APPROVED BY: U. Potapovs — 1-25-82
U. Potapovs, Acting Chief (CS) — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B; and 10 CFR Part 21.

B. SCOPE: Status of previous inspection findings; manufacturing process control; change control; nonconformances and corrective action, and 10 CFR Part 21 implementation.

A. VIOLATIONS:

Contrary to paragraph 21.6 of 10 CFR Part 21, Section 206 of the Energy Reorganization Act of 1974, adopted procedures or permissible alternate notice had not been posted in the Sumter, South Carolina plant.

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Deviation A (79-01): Failure to provide evidence of inspection and acceptability for purchased parts such as separators, spacers, spacer plates and covers, at the E cell assembly line, as required by paragraphs 8.3.2 of the QA Manual, Revision 8, and paragraph 3.7 of procedure QCP-58.0, dated May 19, 1975.

   The inspector verified that in accordance with vendor's corrective action response letter, dated August 24, 1979, the principal suppliers of battery parts were advised by letter, dated May 5, 1980, that the products supplied to Exide must show written evidence of final inspection and acceptance. Observation in the E Line battery assembly area of shipping boxes for spacers, jars and covers received from suppliers, verified that the suppliers are conforming to Exide requirements.

2. (Closed) Deviation B.1 (79-01): Failure to maintain the red lead percentages in four lots of purchased material, within the apparent density range of 20-25 gms/cu.in. as required by paragraph 3.3 of Purchase Requirement No. 2, Section 2, dated September 29, 1977.

   The inspector verified that, in accordance with the vendor's corrective action response letter dated August 24, 1979, a review of the problem showed that the test procedure used at the Sumter plant was incorrect. The Exide material evaluation laboratory at Yardly, Pennsylvania, furnished an approved replacement procedure No. APS-402. After following this procedure at Sumter, the red lead percentages on purchased materials, were within the required range and no further problems were experienced. To prevent recurrence of this problem, all nonconforming material analyses are now reported to the Yardly, Pennsylvania Product Engineering Department by use of the Material Review System which provides for a recommended corrective action to be sent to the plant.

3. (Closed) Deviation B.2 (79-01): Failure to select completed parts twice weekly, inspect them and document this activity in the Small Parts Inspection Record as required by QCP No. 86.1(S), dated December 30, 1977.

   The inspector verified that in accordance with the vendor's corrective action response letter dated August 24, 1979, QC personnel were reinstructed and a memorandum was issued by the QC Manager on August 6, 1979, to all QC personnel, to reemphasize the above inspection requirements. Review of the QC auditor's Small Parts Inspection Records dated June 29, 1979 and November 1981, verified that the twice weekly inspections are being performed.

4. (Closed) Deviation B.3 (79-01): Failure to perform the activities of taking daily samples from the E and C casting pots; titrating them, and posting the results on charts at the titration stations as required by QCP No. 86.1.1(S), dated December 30, 1977.

   The inspector verified that in accordance with the vendor's corrective action response letter dated August 24, 1979, the previously identified QC Manager's memorandum dated August 6, 1979, to all QC personnel, also reemphasized these procedure requirements. Review of Calcium Titration Control Charts for the small parts E-Line No. 3 Pot and E Line No. 3A Pot, both for the period of September 28 through November 4, 1981, verified that this activity is being performed in accordance with QC procedure No. 86.1.1(S).

5. (Closed) Deviation B.4 (79-01): Failure to monitor the assembly lines on a daily basis and record the inspection results on the Stationary Inspection and Process Verification Records for Lines C and E, as required by QCP No. 102.3(S), dated February 13, 1978.

   The inspector verified that, in accordance with the vendor's corrective action response letter dated August 24, 1979, procedure QCP No. 102.3(S) was revised on April 9, 1979, which changed the daily inspection and recording requirement for the C and E assembly lines to a frequency of two times a week. Review of the current Stationary Inspection and Process Verification Records dated November 27, 1981 and December 4, 1981, for the C and E lines, verified that the QC monitoring is being performed as required by the revised procedure.

6. (Closed) Deviation C (79-01): Failure to bring discrepancies found during Quality Control review of four purchase orders, to the attention of the Purchasing Department so corrective action could be taken, as required by QCP No. 30.7, dated November 1, 1978.

The inspector verified that, in accordance with the vendor's corrective action response letter dated August 24, 1979, the practice of directing purchase orders containing discrepancies back to the originator in Production Planning has been discontinued. The discrepant purchase orders are now sent to the Purchasing Department for correction and issue of a revised P.O. Review of six P.O.s dated November 2, 1981, verified that they were reviewed by QC. Two of the P.Os were found to contain discrepancies and were returned to purchasing where correct revised P.O.s were issued.

E. OTHER FINDINGS OR COMMENTS:

1. Manufacturing Process Control - The inspector reviewed seven sections of the Exide QA Manual which were applicable to the C and E lines stationary batteries parts manufacture, assembly, testing, inspecting, and monitoring.

   Observations were made of battery grid and small parts casting, grid pasting and finishing, QC chemical sampling, testing and monitoring, battery assembly, and final inspection.

   Review also included: a customer purchase specification; four Sumter plant QC procedures; three calcium titration control chart records for grid casting pots; a record of the daily report of paste mixing; three QC records of the pasting and finishing process checklists, and two records of QC department stationary product inspection reports.

   Within this area, no nonconformances to NRC or QA program requirements were identified and no unresolved items were identified.

2. Change Control - The inspector reviewed the QA Manual Section 3 "Design Documentation and Change Control" which was appliable to changes in engineering generated manufacturing documents, QC and QA documents.

   A review was also made of: an administrative procedure QAP-55.0 covering document control; two records of Quality Control Notices dealing with changes to QC procedures; two records of Engineering Change Requests covering requests for changes in two Manufacturing Requirements Sheets.

   Within this area, no nonconformances to NRC or QA program requirements were identified, and no unresolved items were identified.

   Review and discussions also established that only the Quality Control Procedures were totally generated, approved, and revised at the Sumter plant level. While changes to engineering, manufacturing, and QA documents could be requested at plant level, the final approval and changes were controlled at the Yardly and Horsham, Pennsylvania engineering, quality assurance, and corporate levels.

3. Nonconformances and Corrective Action - The inspector reviewed two sections of the Exide QA Manual which were applicable to control and disposition of deficiencies found in materials at receiving inspection, parts during manufacture and assembly, and final inspection of the batteries prior to shipment.

   To verify that nonconforming items were reviewed and accepted, rejected, repaired or reworked, and that conditions adverse to quality, including the cause, are promptly identified and corrected, a review was made of: two administrative QA procedures; a Material Review Board Log; ten Material Review Reports; a Corrective Action Request Log; four Corrective Action Requests; a QC Red Tag Log; two completed Red Tags; and a QC Area Controller's list of outstanding Red Tags for November 1981.

   Observations were made of a hold area for items held for Material Review Board Action, and a red tagged battery hold area.

   Within this area, no nonconformances to NRC and QA program requirements were identified, and no unresolved items were identified.

4. 10 CFR Part 21 - The inspector reviewed the administrative procedure QAP-62.0 which provided instructions for the plant QC Manager's completion of a Material Review Report for nonconformances to the corporate Quality Assurance, and of the QA Manual paragraph 15.12 which provided a procedure for QA to evaluate and report nonconformances in accordance with 10 CFR Part 21.

   Observations established that existing posting was in violation of paragraph 21.6 of 10 CFR Part 21, in that only a copy of the regulations was posted. Section 206 of the Energy Reorganization Act of 1974 and adopted procedures (or permissible alternate notice) were observed to be not posted. Prior to the end of the inspection the posting requirements of 10 CFR Part 21 were met and no written response to this violation has been requested.

ORGANIZATION: THE FOXBORO COMPANY
SYSTEMS OPERATIONS DIVISION
FOXBORO AND MANSFIELD, MASSACHUSETTS

REPORT NO.: 99900297/81-01	INSPECTION DATE(S): 11/17-18/81	INSPECTION ON-SITE HOURS: 32

CORRESPONDENCE ADDRESS: The Foxboro Company
ATTN: Mr. C. A. McKay
Executive Vice President
Technology Division
38 Neponset Avenue
Foxboro, MA 02035

ORGANIZATION CONTACT: Mr. F. Leathers, Corporate QA Manager, Field Operations
TELEPHONE: (617) 543-8750

PRINCIPAL PRODUCT: Instrumentation Panel and Rack Packages

NUCLEAR INDUSTRY ACTIVITY: The nuclear output of the Foxboro Company is 2% of sales. There are nine active nuclear orders comprising 64 instrumentation racks.

ASSIGNED INSPECTOR: R. E. Oller — 12-30-81
R. E. Oller, Components Section (CS) — Date

OTHER INSPECTOR(S): L. B. Parker, Reactive Inspection Section (RIS)

APPROVED BY: C. J. Hale for — 12-31-81
U. Potapovs, Acting Chief, CS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B, and 10 CFR Part 21.

B. SCOPE: This inspection was made as a result of: (1) the issuance of a 10 CFR 50.55(e) report by TVA Sequoyah Nuclear Plant, Unit 2 pertaining to damaged limit switch housings; (2) the issuance of a potential 10 CFR Part 50.55(e) report by TVA Sequoyah Nuclear Plant, Unit 2 concerning lack of environmental qualification data for a pressure transmitter; (3) the issuance of a 10 CFR Part 50.55(e) report by TVA Watts Bar Nuclear Plant, Units 1 and 2 concerning potential defects in transmitter amplifiers; and (4) the issuance of a 10 CFR Part 50.55(e) report by TVA Bellefonte Nuclear Plant, Units 1 and 2 concerning electrical control module manufacturing defects. The inspection additionally included status of previous inspection findings, manufacturing process control, nonconformances and corrective action, and 10 CFR Part 21 implementation.

ORGANIZATION: THE FOXBORO COMPANY
FOXBORO AND MANSFIELD, MA

REPORT NO.: 99900297/81-01	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATIONS:

Contrary to paragraph 21.6 of 10 CFR Part 21, the notice which was posted in lieu of the Part 21 regulations contained the name of an individual who was no longer responsible for receiving reports, but did not name the current responsible officer.

B. NONCONFORMANCES:

Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 4.1 of Corporate QA Procedure 3.1.8.2, Revision A, a subsidiary of the Foxboro Company (Foxboro-Jordan, Inc.) failed to report a condition adverse to quality (heat damage to geared limit switch housings in Electrodyne valve motor operators) to the Nuclear Safety Sub-committee.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS: (R. E. Oller)

1. (Closed) Deviation A (80-01): Failure to specifically cover a review against the procedures and audit findings of Inspection Report No. 77-01, during an audit conducted in February 1979. Also, failure of Systems Operations Quality Assurance to conduct audits of pre-insulated terminals for damaged insulation by April 22-25, 1980, when the NRC inspection was performed. Both actions were committed to in Foxboro's corrective action response letters dated March 8, 1979 and April 20, 1979.

   The inspector verified that in accordance with Foxboro Company's letters dated May 29 and June 24, 1980, the Systems Operations Division performed reaudits of the findings and objectives of the NRC Inspection Reports Nos. 77-01, 79-01, and 80-01, including auditing and providing corrective action with regard to the damaged pre-insulated terminals. These audits were performed in August 1980; documented and reviewed by appropriate levels of management.

2. (Closed) Deviation B (80-01): Failure by Foxboro to provide a written procedure to control the issuance of Production Route Sheets, as committed to in Foxboro's corrective action response letter dated March 8, 1979.

   The inspector verified that in accordance with Foxboro Company's letters dated May 29 and June 24, 1980, that procedure No. SORM-308, was written and issued for use in early 1981. Specifically, this procedure assigns the responsibility for issuing the routing files and making changes in them, with the Industrial Engineering Department. Observations verified that the Production Route Sheets were part of the routing file in the rack fabrication area.

E. OTHER FINDINGS OR COMMENTS:

1. Regional Requests (L. B. Parker) -

   a. A 10 CFR 50.55(e) report from TVA Sequoyah Nuclear Plant Unit 2 stated that limit switch housings on Electrodyne valve motor-operators had been heat damaged by resistive-type heaters. The Foxboro Company had not evaluated this problem. TVA stated in the 50.55(e) report that Foxboro-Jordan of Milwaukee, Wisconsin had been notified of the problem and had supplied TVA with additional geared limit switch assemblies. See nonconformance, B. above.

   b. A potential CDR from TVA Sequoyah Nuclear Plant Unit 2 states in part, "Westinghouse Class 1E pressure transmitters manufactured by Foxboro (total of 8 with model No. E11GM) . . . lack environmental qualification data . . . ." The Foxboro Company did not have any knowledge of this potential CDR. The Foxboro Company model No. E11GM pressure transmitter was not intended nor qualified by the Foxboro Company to be used as Class 1E.

   c. A CDR from TVA Watts Bar Units 1 and 2 states in part "Certain 10-50 MA transmitters may contain defects in the amplifier of the transmitter . . . ." The Foxboro Company had determined that specific transmitters model Nos. N-E11, N-E13, with suffix codes /MCA, /MCA/RRW, or /MCA/RR could: (1) have incorrect insulating sleeving on transistor and Zener diode lead wires in the amplifier; and (2) have a capacitor which is not hermetically sealed. Foxboro investigated these deficiencies and had instituted adequate measures to correct and prevent the recurrence of the deficiencies.

   d. A CDR from TVA Bellefonte Units 1 and 2 states in part "Foxboro Inc., has revealed a manufacturing defect in electrical control modules used in auxiliary feedwater and the condensing system . . . ." The Foxboro Company had found that the dual FET (P/N NO282AS) used in a number of Hi-Z modules could exhibit a breakdown characteristic under certain transient conditions. Foxboro investigated these deficiencies and had instituted adequate measures to correct and prevent recurrence of the deficiencies.

2. Manufacturing Process Control (R. E. Oller) - The inspector reviewed six sections of the Foxboro Systems Operations Quality Manual which were applicable to assembly, inspection and electrical test of the in-process and completed instrumentation racks at the Mansfield plant.

   Observations were made of instrumentation racks in various stages of assembly of the wiring and instruments, along with examination of assembly control documents such as: a rack loading drawing, inventory shortage list, system traveler, assembly/fabrication release, and assembly drawings.

   Review also included: a customer purchase specification, two Systems Operations Procedures No. SORM-368 and No. SORM-373, covering the functional electrical testing and the use of the system traveler, respectively;

a file record package for completed and shipped instrumented racks for an Arizona/Bechtel project.

Within this area of the inspection, no nonconformances to NRC, customer order or QC program requirements were identified, and no unresolved items were identified.

3. Nonconformances and Corrective Action (R. E. Oller) - The inspector reviewed two sections of the Foxboro Systems Operations Quality Manual which were applicable to the control and disposition of deficiencies in in-process subassemblies and completed rack assemblies for instrumentation panel and rack packages.

   To verify that nonconforming items were reviewed and accepted, rejected, repaired, or reworked, and that conditions adverse to quality, including the cause, are promptly identified and corrected, a review was made of: three Systems Operations Reference Manual procedures dealing with processing of nonconformances, waiver procedures, and quality hold action, records of monthly N.C.R. data analysis reports; a summary report of fabrication shop inspection results, records of four corrective action requests and a corrective action assignment log; a quality hold action report log, records of eight quality hold action reports, and records of four nonconformance reports. Observations were made of identification of nonconforming materials by using red quality hold tags, and identification of nonconforming racks and panels by attaching nonconformance reports.

   Within this area of the inspection, no nonconformances to NRC, Customer Order or QC program requirements were identified, and no unresolved items were identified.

4. 10 CFR Part 21 Implementation (L. B. Parker) - The inspector reviewed the Corporate QA Procedure CQA 3.1.8.2, "Nonconforming - Defect/Deviation Reporting per 10 CFR Part 21," and the employee "Notice of 10 CFR Part 21 Notification" posted in lieu of the regulation.

   Within this area, one violation was identified.

ORGANIZATION: G&W EAGLE SIGNAL INDUSTRIAL CONTROLS
DAVENPORT, IOWA

REPORT NO.: 99900384/81-01	INSPECTION DATE(S): 9/28-10/2/81	INSPECTION ON-SITE HOURS: 28

CORRESPONDENCE ADDRESS: G&W Eagle Signal Industrial Controls
ATTN: Mr. W. W. Huppert
President
736 Federal St.
Davenport, Iowa 52803

ORGANIZATION CONTACT: Mr. J. M. Hawkinson, Supervisor, QA
TELEPHONE: (319) 326-8111

PRINCIPAL PRODUCT: Industrial Timers and Counters

NUCLEAR INDUSTRY ACTIVITY: This plant processes both nuclear and nonnuclear orders under the same QA program. The final shipment of the last nuclear order was in July 1981. Currently, there are no nuclear orders in process.

ASSIGNED INSPECTOR: R. E. Oller — 12-18-81
R. E. Oller, Components Section (CS) — Date

OTHER INSPECTOR(S):

APPROVED BY: C. J. Hale/for — 12-31-81
U. Potapovs, Acting Chief, CS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50 and 10 CFR Part 21.

B. SCOPE: Status of previous inspection findings; manufacturing process control; change control; nonconformances and corrective action; and 10 CFR Part 21.

A. VIOLATIONS

None

B. NONCONFORMANCES:

1. Contrary to the corrective action commitment in Eagle Signal's response letter dated April 22, 1980, Section 9.3.6.5 "Sampling Plan" of the Quality System Manual (QSM) had not been written (See paragraph D.2.).

2. Contrary to the corrective action commitment in Eagle Signal's response letters dated April 22 and May 15, 1980, Section 9.3.1.5 "Quality Auditing" of the QSM, had not been revised to include all of the elements of a system audit program (See paragraph D.10.).

3. Contrary to the corrective action commitment in Eagle Signal's response letter dated May 15, 1980, a new section of the QSM to provide an overall product test control program, had not been written (See paragraph D.10).

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Violation (80-01): Contrary to paragraph 21.21 of 10 CFR Part 21 and customer purchase order No. 282-TG108, Revision 00, the Eagle Signal Division had not adopted appropriate procedures to provide for evaluating deviations or informing the licensee or purchaser of such deviations.

   The inspector verified that in accordance with the vendor's response letter dated April 22, 1980, a formal procedure, "Product Safety Review Board" was written, approved on July 28, 1980 and added to the Quality Systems Manual as Section 9.3.9.2. Review of this procedure verified that it provided adequate measures for evaluating and reporting of 10 CFR Part 21 conditions.

2. (Open) Deviation A.1 (80-01): Failure to use sample tables from an Inspection Manual Specification approved by the QA engineer, while performing receiving inspection, in accordance with paragraph 1.d of Section 9.3.4.1 of the Quality Systems Manual.

   The inspector verified that in accordance with the vendor's response letter dated April 22, 1980, the sampling plan currently in use is based on Mil-Std-105D. Sampling tables have been developed and are being implemented, and are contained in the QA Engineer approved Inspection Manual Procedure 9.2.0.4. However, contrary to the vendor's commitment, the Quality Systems Manual Section 9.3.6.5 which would

contain the sampling plan, has not been written (see B.1 above).

3. (Closed) Deviation A.2 (80-01): Failure to date, initial and stamp five packing tickets after completion of receiving inspection for materials, in accordance with paragraph 1.e. of Section 9.3.4.1 of the Quality Systems Manual (QSM).

   The inspector verified that in accordance with the vendor's response letter dated April 22, 1980, Section 9.3.4.1 of the QSM was revised on July 18, 1980, to change the marking requirement from dating, initialing and stamping of each item line on the packing ticket, to stamping and dating only once on each packing ticket, after acceptance of part or all of the material. Observations verified this practice was being implemented.

4. (Closed) Deviation B.1 (80-01): Failure to apply a label to the Digital Multimeter S.N. GT-1007, to indicate the date of last calibration, by whom it was calibrated and when the next calibration was due, in accordance with Item 6 of Section 9.3.7.3 of the Quality Systems Manual.

   The inspector verified that in accordance with the vendor's response letter dated April 22, 1980, the subject device was properly labeled prior to the end of the previous inspection. Records show that it was currently calibrated on September 21, 1981, on a three month frequency.

5. (Closed) Deviation B.2 (80-01): Failure to enter on record cards each calibration result as it was accomplished for DC Ammeter S.N. T-1001 and DC Voltmeter S.N. T-3001 in accordance with Item 9 of Section 9.3.7.3 of the Quality Systems Manual.

   The inspector verified that in accordance with the vendor's response letter dated April 22, 1980, the two above devices are being calibrated and the results are being properly recorded. The devices were currently calibrated on September 24, 1981, and September 29, 1981, respectively.

6. (Closed) Deviation B.3 (80-01): Failure to identify the procedure governing the service and calibration, on the Instrument Identification Record Card of DC Ammeter S.N. T-1001, DC Voltmeter S.N. T-3001 and the AC Variac S.N. T-2015, in accordance with Annex III to Section 9.3.7.3 of the Quality Systems Manual.

   The inspector verified that in accordance with the vendor's response letter dated April 22, 1980, the applicable EWB-804 calibration procedure identification was entered on the Instrument Identification Record Cards for the above instruments. The balance of record cards are in the process of being updated.

7. (Closed) Deviation B.4 (80-01): Failure to write in the "Instrument Indication Block" on the record card the measurement observed on the inspected instrument during testing at the standard calibration point for DC Ammeter S.N. T-1001.

   The inspector verified that in accordance with the vendor's response letter dated April 22, 1980, the actual test values are now being recorded for the above type instrument during testing at the calibration point.

8. (Closed) Deviation E.1 (80-01): Failure by the QA Engineer to provide an Inspection Checklist to the Inspection Department for the Contact Stack, Part No. HP-50-117, at the time of engineering release, in accordance with Section 9.3.6.1 of the Quality Systems Manual.

   The inspector verified that in accordance with the vendor's response letter dated April 22, 1980, the Inspection Check List for the HP-5 Cycle-Flex Unit, which includes the HP-50-117 subassembly, was upgraded on May 5, 1980 and approved for use on April 14, 1981. Review of current check list records verified that the upgraded checklist was provided to the Inspection Department and that it is being implemented.

9. (Closed) Deviation E.2 (80-01): Failure to include in the HP-5 Inspection Checklist for Timer, Part No. HP-57A6 the required electrical tests and a description of the procedure and setup of the test equipment, in accordance with paragraph d. of Section 9.3.6.1 of the Quality Systems Manual.

   The inspector verified that in accordance with the vendor's response letter dated April 22, 1980, the functional electrical test procedures, which include the procedure and setup for the five HP-5 Cycl-Flex-Timer test racks, have been consolidated into one book, and each inspector has a copy of the book.

10. (Open) Deviation D (80-01): Failure to include in the QA Program the areas of Test Control, Corrective Action, QA Records and Audits, in accordance with Criterion II of Appendix B to 10 CFR Part 50, and a customer's purchase order.

    The inspector verified that in accordance with the vendor's response letters dated April 22, 1980, and May 15, 1980, the following actions have occurred:

    D.1. The Quality Systems Manual (QSM) new Section 9.3.2.1, "Corrective Action Internal" was prepared and approved for use on February 13, 1981. This item is closed.

D.2. The QSM new Section 9.3.9.3, "Document Retention Program" was prepared and approved for use on February 19, 1980. This item is closed.

D.3. The QSM Section 9.3.1.5, "Quality Auditing" which covers product audits, has not been revised to include all elements of a system audit as committed to in the vendor's letter dated May 15, 1980. This item remains open. See B.2 above.

D.4. A new QSM Section No. 9.3.0.3 or 9.3.9.2 to provide an overall product test control program has not been written as committed to in the vendor's letter dated May 15, 1980. This item remains open. See B.3 above.

11. (Closed) Deviation E (80-01): Failure to establish measures to assure that devices such as gram gauges, feeler gauges, torque wrenches and torque screw drivers, used in activities affecting quality, are controlled and calibrated, in accordance with Criterion XII of Appendix B to 10 CFR Part 50.

    The inspector verified that in accordance with the vendor's response letters dated April 22, 1980 and May 15, 1980, a new QSM Section 9.3.7.1, "Mechanical Measuring Equipment," was written and approved on May 20, 1981, to provide measures to control, calibrate and document all mechanical gages.

12. (Closed) Unresolved Item D.3.b (80-01): It appeared that two similar forms No. EWB-270 "Material Inspected Record" and No. EAG-270 "Historical Record" were used by Receiving Inspection for the same purpose without specific reasons for using the two forms. Also both of these forms provided for inspection dispostion of each line item, however, the current practice is to use only one inspection stamp dispostion per page instead of by line item.

    The inspector determined that the title and number of one form was changed to "Historical Daily Part Inspection Record" No. EAG-270A to provide a permanent part identity record while the other form was changed to "Daily Material Inspection Record" No. EAG-2290 to provide for a daily inspector activity record. Observation verified that both of these forms were in use.

13. (Closed) Unresolved Item E.3.b (80-01): Although Section 9.3.1.5 of the Quality Systems Manual indicates that product audit characteristics refer to standards provided in the Inspection Manual No. 9.2.0.0., it was determined that the Inspection Manual had not been written.

    The inspector determined that the Inspection Manual No. 9.2.0.0. has been complied and is in a review and revision status. Completion is expected within a few months.

E. OTHER FINDINGS OR COMMENTS:

1. Manufacturing Process Control

The inspector reviewed four sections of the Eagle Signal Quality System Manual which were applicable to material receiving, manufacturing, patrol and final inspection, and final electrical tests for timers and counters. The same QA program covers items manufactured for both nuclear and non-nuclear service.

Observations were made on in-process assembly, inspection and electrical tests of both electro-mechanical timers and printed circuit boards for solid state products, using manufacturing route sheets for control of both subassemblies and component assemblies.

Review also included: a soldering standard; manufacturing route sheets for control of subassemblies and component assemblies; seven daily inspection reports of audit; patrol inspection check lists; a weekly summary record of inspections for electro-mechanical components; a book of technical methods; and a book of electrical inspection test procedures.

Within this area, no nonconformances to NRC and quality program requirements were identified, and no unresolved items were identified.

2. Change Control

The inspector reviewed three sections of the Quality System Manual which were applicable to changes in new designs, existing models and drawings.

A review was also made of an engineering specification change procedure and the related records consisting of 12 engineering change orders, and a product model upgrading record log book, to verify that changes in engineering, production, inspection and test activities were documented, reviewed and approved as required by Quality System Program.

Within this area, no nonconformances to NRC and the quality program requirements were identified and no unresolved items were identified.

3. Nonconformances and Corrective Action

The inspector reviewed four sections of the Quality System Manual which were applicable to the control and disposition of deficiencies in in-process subassemblies and component assemblies for timers and counters and also for those units in inventory which require upgrading.

To verify that nonconforming items were reviewed and accepted, rejected, repaired or reworked, and that conditions adverse to quality, including the cause, are promptly identified and corrected, a review was made of: two material deviation reports; a record of hold tag and nonconformance; six corrective action requests, and four nonconformance review reports. Observations were made of segregated hold areas, and the nonconforming items therein, in the receiving inspection area, fabrication department and the electro-mechanical inspection area.

Within this area, no nonconformances to NRC or quality program requirements were identified, and no unresolved items were identified.

ORGANIZATION: GENERAL ATOMIC COMPANY
FUEL OPERATIONS DIVISION
SAN DIEGO, CALIFORNIA

REPORT NO.: 99900004/82-01	INSPECTION DATE(S) 2/22-25/82	INSPECTION ON-SITE HOURS: 22

CORRESPONDENCE ADDRESS: General Atomic Company
Fuel Operations Division
ATTN: Mr. D. R. Van Hilton, Executive Vice President
P. O. Box 81608
San Diego, California 92138

ORGANIZATIONAL CONTACT: Mr. T. R. Colandrea, Director, QA Division
TELEPHONE NUMBER: (714) 455-4570

PRINCIPAL PRODUCT: Nuclear Fuel Assemblies

NUCLEAR INDUSTRY ACTIVITY: Nuclear fuel supplier for GA designed cores.

ASSIGNED INSPECTOR: W. M. McNeill — 3/15/82
W. M. McNeill, Reactive & Components Program Section (R&CPS) — Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes — 3/16/82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: Document controls; fuel particle manufacturing; procurement controls; and follow up on previous inspection findings.

PLANT SITE APPLICABILITY: Components/records identified with the following nuclear facility were examined during this inspection: Docket No. 50-267.

ORGANIZATION: GENERAL ATOMIC COMPANY
FUEL OPERATIONS DIVISION
SAN DIEGO, CALIFORNIA

REPORT NO.: 99900004/82-01	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None.

B. NONCONFORMANCES

Contrary to Criterion V of Appendix B to 10 CFR 50 and the QA Manual, Section 6, paragraph 5.1, the latest available document index was applicable to Segment 8 (the second reload for Fort St. Vrain), whereas manufacturing was working on Segment 10 (the fourth reload). Segment 9, the third reload, manufacture was also complete. No indexes existed in regard to Segment 9 and 10 manufacture.

C. UNRESOLVED ITEMS:

None.

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Nonconformance (81-10): The chemistry lab results were erroneously recorded on the run sheet for a mix lot. A review of run sheets of current production found no further recording errors nor out-of-specification results.

2. (Closed) Nonconformance (81-01): One special process was not audited in 1980 and 1981. The special, in question (BAF Measurements), was audited and the 1981 audit report amended to reflect that audit. Audit check lists have changed to prevent this problem.

3. (Closed) Nonconformance (81-01): The records of lead auditors had no evidence of a passing score on the written exam or performance of a practical examination. All auditor records were rewiewed and a practial examination documented for each auditor.

4. (Closed) Nonconformance (81-01): Nonconforming material was found to be not tagged and erroneous Nonconformance Report numbers were documented on material. A review of the shop and storage areas found all nonconforming material to be properly tagged with the correct report numbers. The procedure has been changed to further clarify this area and prevent additional problems.

ORGANIZATION: GENERAL ATOMIC COMPANY
FUEL OPERATIONS DIVISION
SAN DIEGO, CALIFORNIA

REPORT NO.: 99900004/82-01	INSPECTION RESULTS:	PAGE 3 of 3

E. OTHER FINDINGS OR COMMENTS:

1. Document Control - A sample of 47 manufacturing and inspection procedures were verified to be reviewed, approved and distributed properly. This sample included manufacturing procedures, parameter sheets, procedure changes sheets, and inspection instructions. A sample of 11 design documents were verified in a like This sample included specifications, drawings, Change Notices, and Waivers. One nonconformance was identified in this area. Document indexes are used to dictate the revision level of any document.

   Segment 8 was manufactured and finished fabrication in May 1979. Segment 10 was started in July 1981. Segment 9 was manufactured and fabricated in-between. Design was lagging in the issuance of its index till after manufacture and fabrication.

2. Fuel Particle Manufacturing - The processes of the thorium bed conversion and particle Silicon carbide coating were inspected. The processes were witnessed and conformance to the procedures and specification was verified.

3. Procurement Controls - The procurement of thorium was inspected. The reviews and approval of the purchase order and requistion verified. The overcheck inspection was verified. The documentation on out-of-specification findings per the nonconforming procedure was verified.

ORGANIZATION: GENERAL ATOMIC COMPANY, ELECTRONIC SYSTEMS DIVISION
SAN DIEGO, CALIFORNIA

REPORT NO.: 99900387/81-02	INSPECTION DATE(S): 12/14-18/81	INSPECTION ON-SITE HOURS: 60

CORRESPONDENCE ADDRESS: General Atomic Company
Special Products
ATTN: Mr. P. E. Bissonnette
General Manager
Post Office Box 81608
San Diego, CA 92138

ORGANIZATION CONTACT: Mr. J. G. Kelly, Quality Assurance Manager
TELEPHONE: (714) 455-3205

PRINCIPAL PRODUCT: Radiation Monitors

NUCLEAR INDUSTRY ACTIVITY: Gas or area radiation monitors and liquid or process radiation monitors for approximately 50 reactor sites. Some of the equipment is Class 1E.

ASSIGNED INSPECTOR: William M. McNeill — 2/12/82
W. M. McNeill, Components Section (CS) — Date

OTHER INSPECTOR(S): W. E. Foster, Reactive Inspection Section (RIS)

APPROVED BY: Uedis Potapovs — 2-19-82
U. Potapovs, Acting Chief, CS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made as a result of the issuance of 10 CFR Part 21 reports pertaining to: (1) Area Monitor Countrate Assemblies, RP-2C, that had been furnished to the Zion Nuclear Power Station Units Nos. 1 and 2; and (2) Rockbestos Coaxial Cable, RSS-6-104, that had been furnished to numerous nuclear power stations. The inspection also addressed a report of inadequate electrical insulation on Ex-Core Neutron Flux Detectors that had been furnished to the Waterford Nuclear Power Station, Unit No. 3. QA programmatic areas included in the inspection were manufacturing process control, nonconformances and corrective action, control of special processes, and status of previous inspection findings.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 5 in Section 5 of the QA Manual, unbracketed operations were not always performed in sequence; e.g., the Traveler for Process Air Monitor (351-1801-01) serial number 3 had Operation 25 (burn-in test) dated October 11, 1981, and Operation 20 dated November 3, 1981.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 3 in Section 2 of the QA Manual, the standard and project Integrated Manufacturing and Quality Plans did not describe the test procedures and standards contained in the applicable contract requirements listed in Service Request 171207.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 5 in Section 11 of the QAM Manual, inspection did not perform the required verification of all testing activities, as evidenced by the following examples:

   a. A test operation was signed and dated on the Traveler for Particulate, Iodine and Gas Detector (373-1101-03) serial number 1, without an impression of the "Test Performance Copy" stamp having been signed and dated on the approved test procedure.

   b. The required entries had not been made in Qualification Test Procedure 0360-2082.

   c. Incorrect and missing information was noted in regard to Test Report 0359-9004 dated September 30, 1981.

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 4.1 in Section 14 of the Manufacturing Operations Manual, Travelers did not reflect the appropriate document numbers, as evidenced by the following examples:

   a. Revision A of drawing 373-0522-00 was erroneously entered into the Traveler for Control Room Cabinet (373-0501-02) serial number 1.

   b. Revision 1 of Test Procedure 0373-9003 was erroneously listed in the Traveler for Particulate, Iodine and Gas Detector (373-1101-01) serial number 1.

5. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraphs 5.3 in Section 11 and 5.2.5 in Section 15 of the QA Manual, Clean-up Sheets (CUSs) generated by the Test Department are not entered on Travelers, as evidenced by the following examples:

   a. CUS T10000 305 was not entered on the Traveler for Liquid Monitor (373-2501-01) serial number 1.

   b. CUS 7804 and 7901 were not entered on the Traveler for Process Air Monitor (351-1801-01) serial number 3.

   c. CUS 7172 was not entered on the Traveler for Area Monitor (373-3801-01) serial number 2.

6. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and paragraph 5.3 in Section 10 and paragraph 5.2.5 in Section 15 of the QA Manual, material is being released for subsequent assembly with discrepancies unresolved, for example, a CUS 4655 was issued on a microprocessor. This microprocessor was assembled into a Process Area Monitor Assembly although the CUS was unresolved.

7. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 5.2.8 in Section 15 of the QA Manual, CUS 7804 was not signed and dated, as required, to denote completion of corrective actions on Process Area Monitor (351-1801-01) serial number 3.

8. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 2 in Section 16 of the QA Manual, those discrepancies coded as engineering errors and those identified by Test Department CUSs in the test reports on the Test Procedures and Failure Log are not subject to monthly review for corrective action analysis.

9. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 2 in Section 9 of the QA Manual, personnel performing special processes were observed to have been either not qualified for the process, or their qualifications were not a matter of record.

C. UNRESOLVED ITEMS:

The Traveler for the Moving Filter Particulate Iodine Gas Monitor, Drawing No. 0373-1101-03, Revision A, indicates that calibration is to be performed in accordance with Test Procedures Nos. 0360-9916A and 0360-9919A. The inspector noted that an additional procedure, No. ELA281-9001, Revision K, was also used to provide step-by-step details of calibration. However, the latter procedure was not identified on the Traveler or referenced in the identified procedures.

As a result of the foregoing; the inspector was unable to determine the legitimacy of the usage of the latter procedure.

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Nonconformance (81-01): Travelers did not fully control the sequences of operations, operations required, and dating of operations performed. A review of a sample of eight travelers found all required operations listed and dating of operations performed. In regard to the sequence of operations one nonconformance was identified.

2. (Closed) Nonconformance (81-01): Conformance to contract requirements was not fully inspected in the areas of pneumatic tests, skid mount nuts, motor performance, and signal reproducibility. General Atomic has obtained waivers on the pneumatic tests and motor performance. A clarification of the skid mount nuts has been obtained and test data has been analyzed to prove signal reproducibility.

3. (Closed) Nonconformance (81-01): Some documents were not controlled in particular Wire Lists. A procedure OP-302 has been implemented to control Wire Lists and other manufacturing aids. A review of Wire Lists in current use found no further problems.

E. OTHER FINDINGS OR COMMENTS:

1. Manufacturing Process Control - A recent Service Request was reviewed and the nine travelers generated based on that Service Request for Wide Range Gas Monitors. The translation of contract requirements into Traveler operations was verified. The use of Integrated Manufacturing and Quality Plans was verified; however, a nonconformance was identified in regard to the plans. Receiving inspection activities were reviewed for four bought components. In-process inspection and test activities were inspected. A nonconformance was identified in the area of test controls. Another nonconformance was identified on the entering of correct information on Travelers. In regard to this nonconformance, it was noted that the Document and Drawing List for the drawing in question was also in error. The testing was done to the most current revisions of the procedures, not that identified on the Travelers.

2. Control of Special Processes - The qualification log and a sample of nine operators found with soldering equipment in the shop. A review was also done of the solder procedure and the operator's qualification cards. In this area one nonconformance was identified.

3. Nonconformances and Corrective Actions - The nonconformances are identified on Clean-Up Sheets. These are later analyzed for trends and corrective action. The nonconformances identified on eight Travelers were reviewed. Eleven recent Material Review Board Reports and seven recent Corrective Action Requests were inspected. In this area five nonconformances were identified.

4. Follow Up On 10 CFR Part 21 Reports

a. RSS-6-104 Coaxial Cable

Failures had occurred during qualification testing of a newly designed RD-6 Detector; however, they were considered random. Preliminary investigation indicated that the high voltage power supply providing 1800 volts direct current to the RD-6 Detector had been overloaded and damaged. Subsequent engineering tests showed that the RSS-6-104 cable which carries the high voltage to the detector had short-circuited. X-rays revealed that several locations in the five foot sections of the high voltage and signal cables could have caused the short circuit. Further investigation of the general performance of the RSS-6-104 cable revealed the severity of the problem.

Corrective actions are in progress with customers and the supplier. Defective cables will be replaced by the supplier and General Atomic. A procedure had been initiated and implemented to conduct a more extensive inspection of the RSS-6-104 cable at receiving inspection in order to preclude recurrence.

Corrective actions and preventive measures are considered to be adequate.

b. Area Monitor Count Rate Assembly, RP-2C

Four resistors were overstressed when the internal high voltage power supply was adjusted above 700 volts direct current (VDC); the normal operating voltage was about 850 VDC. An engineering analysis identified requirements and appropriate replacement resistors.

Corrective action included the release of an Engineering Change Order Rework Instruction Sheet for serial numbers 001 through 075 and providing parts and rework instructions to the Commonwealth Edison Company for the Zion Nuclear Power Plant, Units Nos. 1 and 2. An Engineering Change Order had been released and affected drawings had been revised to preclude recurrence. The inspector observed that hardware was being manufactured in accordance with the revised drawings.

Corrective actions and preventive measures are considered to be adequate. However, during the effort to verify that the latest configuration of the area monitor had been subjected to qualification testing, it was determined that the Qualification Test Procedure (QTP) had not been completed as required. The responsible engineer informed the inspector that documentation of more recently conducted qualification tests had been completed as required. The inspector reviewed a recently completed QTP and determined that it, too, had not been completed as required. This is considered to be a nonconformance and has been included in Nonconformance B.3.

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5. Follow Up on a Regional Request

Inadequate Electrical Insulation on Ex-Core Neutron Flux Detectors

General Atomic Company (GAC) had not been apprised of the problem at the Waterford Nuclear Power Station; however, they had discussed this insulation with the Combustion Engineering Company (CEC) as early as August 1977. In October 1977, CEC issued a purchase order to GAC to substitute the insulation and shorten the detector holder assembly tailpieces of the eight detectors at Arkansas Nuclear One, Unit No. 2. A CEC Certification of Equipment, dated October 14, 1977, attests to completion of the task.

ORGANIZATION: GIBBS AND HILL, INC.
NEW YORK, NEW YORK

REPORT NO.: 99900524/81-04	INSPECTION DATE(S): 11/2-6/81	INSPECTION ON-SITE HOURS: 35

CORRESPONDENCE ADDRESS: Gibbs and Hill, Inc.
ATTN: Mr. P. P. DeRienzo, Vice President
Quality Assurance
393 Seventh Avenue
New York, NY 1001

ORGANIZATION CONTACT: Mr. N. N. Keddis, QA Manager
TELEPHONE: (212) 760-5450

PRINCIPAL PRODUCT: Architect Engineering and Consulting Services

NUCLEAR INDUSTRY ACTIVITY: The total effort committed to domestic nuclear design activities is approximately 23% of the 2,000 employees of Gibbs and Hill, Inc. at their New York facilities. Major projects include the design of Comanche Peak Units 1 and 2, Three Mile Island Unit 1 FSAR update, Beaver Valley Unit 1 equipment update, and Bellefonte Unit 1 design studies.

ASSIGNED INSPECTOR: D F Fox — 12/30/81
D. F. Fox, Reactor Systems Section (RSS) — Date

OTHER INSPECTOR(S):

APPROVED BY: C J Hale — 12-30-81
C. J. Hale, Chief, RSS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B; Topical Report GIBSAR-17A; and the PSAR and FSAR for the Comanche Peak Steam Electric Station (CPSES), Units 1 and 2.

B. SCOPE: Design corrective action, procurement source selection, procurement document control, status of the Design Change Authorization Master Index, and status of previous inspection findings.

ORGANIZATION: GIBBS AND HILL, INC.
NEW YORK, NEW YORK

REPORT NO.: 99900524/81-04	**INSPECTION RESULTS:**	**PAGE** 2 of 4

A. VIOLATIONS:

None

B. NONCONFORMANCES:

Contrary to CPSES project procedures DC-5 and DC-9, certain of the changes made in Revision 3 of specification 2323-MS-46A were not identified nor design reviewed as required.

C. UNRESOLVED ITEMS:

Section 2.0 of G&H CPSES project procedure DC-9 commits the Project Quality Assurance Department to conduct surveillance of design review activities in accordance with Procedure QA-1 to establish that the work is being performed in accordance with current procedures. The inspector could not determine the reason that QA surveillance did not identify that changes made to Revision 3 of specification 2323-MS-46A were not identified, nor that the edited and finished typed revisions of specifications were not being design reviewed, as required by procedure DC-5.

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

(Closed) Nonconformance (81-03): Vendor drawings were approved even though they did not meet the requirements of the specification nor the in-house design.

G&H piping specifications 2323-MS-43A and 43B were revised via DE/CD S-2351 on August 17, 1981, to allow the use of 300 PSIG rated type F316 flanges to replace 600 PSIG rated type F304 flanges where appropriate. G&H engineering management stated that a 100% check by G&H of all 600 PSIG systems that interface with Westinghouse supplied valves verified that all deficient G&H specified mating flanges have been identified. Component Modification Cards were issued by CPSES Site Engineering to replace the deficient flanges at the site.

Subsequent to the commission of this design error, G&H revised three Project Control Procedures, four Design Control Procedures, and three Quality Assurance Procedures to strengthen control of the design process and to prevent recurrence of vendor-related design deficiencies.

E. OTHER FINDINGS OR COMMENTS:

1. Design Corrective Action - The related sections of the CPSES Project Procedures Manual, PSAR, and FSAR were examined to determine the commitments and requirements relative to design corrective action. Five specifications, 11 calculations, a computer run, 16 drawings, 21 design and component change documents, 23 design verification record packages, two purchase orders and 30 supplements thereto, and 25 letters and memoranda related to nuclear safety class pipe hangers, supports and whip restraints were examined to verify effective implementation of commitments.

   With respect to the nonconformance identified in Section B of this report records were not available to verify that changes delineated in letter number CPPA-8062, and made but not identified in Revision 3 of 2323-MS-46A, were design reviewed. Engineering management stated that a marked up copy of the previous issue of the specification was reviewed by the design reviewer but was inadvertantly discarded after the design review was completed.

   The inspector noted that procedures existed since April 1981 that required: (1) the identification of, and the determination of the cause of, significant or recurring design deficiencies or errors discovered during the design verification process or other means; and (2) that appropriate changes be instituted in the design process and the quality assurance program to prevent similar types of deficiencies or errors from recurring. However, no design deficiencies or errors have been identified to date as significant or recurring even through DE/CD S-2531 and other similar DE/CDs and DCAs were reviewed and approved on August 17, 1981, to correct a recurring design error in specifications 2323-MS-43A and 43B, and CMCs were reviewed and issued to replace installed piping system flanges that were of the improper material and pressure rating to mate with vendor supplied valves.

   The QA Departments surveillance responsibilities in these and other design activities is considered unresolved and will be inspected further in subsequent inspections. (See C. above).

   Except as described herein, the committed program for design corrective action was being implemented in the areas examined.

2. Procurement Source Selection, Procurement Document Control, Evaluation of Supplier Performance and Verification Activities - The related sections of the Topical Report, Quality Assurance Manual, and the CPSES Project Procedure Manual were examined for compliance with regulatory requirements. The inspector noted that the requisite procedures have been approved and are in-place. However, the effectiveness of the implementation of the procedures could not be determined at G&H-NY since the responsibility for all procurement actions, expediting, and retention of all related records and documents was assumed by Texas Utilities Services, Inc. in May of 1980 as documented in letter CPP-A-4961 dated May 6, 1980.

3. Status of the Design Change Authorization (DCA) Master Index -
The inspector noted in inspection report 81-03 that certain design change documents were not readily available at the G&H New York facilities and that anomalies existed between the computerized DCA Master Index and the documents themselves.

G&H management stated that all affected DCAs will be identified, collected, and reviewed by April 30, 1982, and that the DCA Master Index will be updated by June 30, 1982. This item will be examined when the G&H actions are completed.

ORGANIZATION: GILBERT/COMMONWEALTH, UTILITIES GROUP
READING, PENNSYLVANIA

REPORT NO.: 99900525/81-03	INSPECTION DATE(S): 10/13-16/81	INSPECTION ON-SITE HOURS: 35

CORRESPONDENCE ADDRESS: Gilbert/Commonwealth
Utilities Group
ATTN: Mr. H. Lorenz, Group Vice President
Post Office Box 1498
Reading, PA 19603

ORGANIZATION CONTACT: Mr. N. R. Barker, Vice President, QA
TELEPHONE: (215) 775-2600

PRINCIPAL PRODUCT: Architect Engineering and Consulting Services

NUCLEAR INDUSTRY ACTIVITY: The total effort committed to domestic nuclear activities at the Reading facilities is approximately 34% of the 2700 person staff of the Utilities Group. Major projects include Perry Units 1 and 2, V. C. Summer, Unit 1, and Three Mile Island, Unit 1 Restart.

ASSIGNED INSPECTOR: D F Fox — 1/5/82
D. F. Fox, Reactor Systems Section (RSS) — Date

OTHER INSPECTOR(S):

APPROVED BY: C J Hale — 1-18-82
C. J. Hale, Chief, RSS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B; Topical Report GAI-TR-106; and the SARs for the Perry Nuclear Power Plant, Units 1 and 2, and the V. C. Summer Nuclear Station, Unit 1.

B. SCOPE: Determine the status of committed corrective action and preventive measures for previous inspection findings and a special inspection to determine the cause, significance, and design corrective actions taken on: (1) a South Carolina Electric and Gas Company 10 CFR Part 21 report that the V. C. Summer Nuclear Station, Unit 1, reactor building containment spray system sodium hydroxide liquid storage tank was not procured to

INSPECTION BASES AND SCOPE (cont'd)

operate under vacuum conditions as required; (2) a Gilbert/Commonwealth 10 CFR Part 21 report that the anchor and barrier plates, which attach piping to the Perry Nuclear Power Plant, Units 1 and 2, ASME Code Class MC containment penetration sleeves, were not impact tested or normalized as required; and (3) a Tennessee Valley Authority 10 CFR Part 50.55(e) report that the snubber for seal bypass piping of a Sequoyah, Unit 2, reactor coolant pump was misoriented.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to G/C 10 CFR Part 21 report to NRC dated April 28, 1981, revision XI of specification SP-527-4549-00 does not specifically address the material requirements for the Perry, Units 1 and 2, anchor and barrier plates of containment mechanical piping penetration assemblies as committed.

2. Contrary to section 3.0 of ANSI N45.2.11, design specifications 597-044461-00, 592-044461-00 and 527-4549-00 did not include all the required design input data (see sections E.1 and E.2 for details).

3. Contrary to the requirements of Criterion V of Appendix B to 10 CFR Part 50 and TVA procedures CEB-SQN-100 and SQN-DC-V-13.3, a piping system analyst did not identify, nor note on the affected piping system stress isometric drawing 47K-406-128, that the spatial orientation of the X-axis used in stress calculation 0600154-08-17 was reversed from the conventional orientation. Further, the checker failed to detect and record the error as required by the Sequoyah Nuclear Power Plant Checking Procedure.

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and section 4.1.4 of V. C. Summer procedure 4.2.1, Mechanical Department calculation 13.19 dated June 11, 1981, did not note the specific purpose or objective of the calculation nor the source of the negative three PSIA pressure differential and atmospheric pressure variation that were used as design inputs to the calculation.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Nonconformance (81-01): Design errors and deficiencies were not detected by the design verification cycle nor during the performance of QA audits.

   The report of the Task Force, established by G/C to investigate the effectiveness of the G/C design control process, was completed as committed. The report contains 16 specific recommendations for improving the design control process and was submitted to the G/C QA Policy Committee for their consideration on October 16, 1981.

   Similarily, design errors and deficiencies identified in this inpsection report were not detected by the design verification cycle nor during the performance of QA audits. The effectiveness of the implementation of the Task Force's recommendations for assuring that design documents are thoroughly reviewed and design verified continues to be a concern and will be further inspected during subsequent inspections.

2. (Closed) Follow up (81-02): Interdisciplinary review and design verification of certain electrical and I&C design drawings did not appear to be formalized in procedures as required by Sections 4.0 and 6.0 of ANSI N45.2.11.

   G/C engineering management stated that Design Control Procedure DCP:1.25 and Instrument and Control Section Procedure DP:0423-2.0.0 will be revised by October 25, 1981, to require timely interface review and design verification of electrical and I&C design drawings.

3. (Closed) Follow up (81-02): Design documents may not have been verified in a timely manner.

   This item resulted in nonconformances B.2 and B.4 above.

4. (Closed) Follow up (81-02): The QA program for design corrective action may not totally satisfy Section 9.0 of ANSI-N45.2.11-1974.

G/C engineering management stated that a new DCP would be issued by December 31. 1981, to implement all of the requirements for design corrective action delineated in Section 9.0 of ANSI N45.2.11-1974. G/C QA management stated that an annual assessment of the congruency of G/C design control procedures with committed ANSI standards would be conducted and documented.

E. OTHER FINDINGS OR COMMENTS:

1. Special inspection to determine the cause, significance, and design corrective action taken by G/C on a South Carolina Electric and Gas Company 10 CFR Part 21 report that the V. C. Summer Nuclear Station, Unit 1, reactor building containment spray system sodium hydroxide tank was not procured to operate under vacuum conditions as required. Review of available documentation and interviews with cognizant engineering and management personnel indicate that the installed V. C. Summer, Unit 1, containment spray sodium hydroxide storage tank was not designed for vacuum operation, the tank's vacuum relief valves were not specified for use under outdoor environmental conditions, nor were the valves required to operate after a design basis seismic event. The safety concern was that when the containment spray system is activated, sufficient sodium hydroxide to remove the iodine that may be present in the containment's atmosphere may not be available due to failure of the vacuum relief valves to allow drawdown of the liquid from the tank.

   The tank was ordered on December 9, 1975, under G/C specification SP-597-044461-00 to operate in the pressure range from 0 PSIG to + 3 PSIG under the provisions of Subsection ND of the ASME Code. Paragraph ND-3821.1 permits a maximum negative pressure differential (vacuum) of 0.5 ounce per square inch unless the tank was specifically designed otherwise.

   The vacuum relief valves were ordered on September 9, 1976, under G/C Specification 592-044461-00. The specification required the valves to operate at a negative pressure of 0.5 PSIA (not 0.5 ounce per square inch) and omitted the requirements for operability of the valves when installed in an outdoor environment and for operability after being subjected to a design basis seismic event as required by Regulatory Guide 1.48. Seismic qualification (of the pressure boundary) was specified.

   The tank and associated vacuum relief valves were installed outside the Auxiliary Building in accordance with G/C design drawings. Startup Field Report SFR-3843 identified that dirt, water, and rust were observed on the seat of the valves. Subsequent investigation by G/C engineering revealed the design deficiencies discussed above.

G/C engineering determined by analysis (Mechanical Department Calculation 13.19 dated June 11, 1981) that the as-built tank could withstand a negative three PSIA pressure differential and revised specification 597-044461-00 on April 21, 1981. The inspector could not determine if the manufacturer of the tank was advised of this change to the specification. The inspector noted that the revised specification could permit operation of the tank outside of the limits of: (1) the design pressure as specified to the fabricator of the tank and the design pressure limitations defined in the ASME Code (ND-3821.1); the pressures certified in the existing manufacturer's Data Report (ND-3812); and (3) the "N" stamping of the tank itself (NA-8000).

Valve Specification 592-044461-00 was revised on April 27, 1981, to include the requirement for operability after a design basis seismic event. The valves themselves have reportedly been returned to the manufacturer for qualification testing and their status could not be determined during the inspection. The specification was not revised to include a requirement for operability in an outdoor environment since G/C engineering determined that the valves (but not the tank) should be relocated to inside the Auxiliary Building and revised the piping and structural drawings accordingly.

Two nonconformances were identified in ths area of the inspection (see B.2 and B.4 above).

2. Special inspection to determine the cause, significance, and design corrective action taken by G/C on a G/C 10 CFR Part 21 report that the anchor and barrier plates, which attach piping to the Perry Nuclear Power Plants, Units 1 and 2, ASME Code Class MC containment penetration sleeves, were not impact tested or normalized as required.

Review of available documentation and interviews with cognizant personnel indicate that Perry, Units 1 and 2, containment piping penetration anchor and barrier plates were not designed in accordance with SAR commitments nor were they fabricated (some of which had been installed) in accordance with applicable ASME Code requirements for components to be subsequently welded to Code Class MC metal containment components.

The safety concern was that the weldment and/or the plates could fail ("brittle fracture") under postulated accident conditions and result in potential offsite exposures exceeding allowable limits.

The anchor and barrier plates were ordered as integral parts of certain piping spool pieces on July 4, 1977, under G/C Specification SP-527-4549-00. The specification did not specifically require impact testing as required by paragraph NE-4431 of the ASME Code for Safety Class 2 and 3 piping and component support materials that are permanently attached by welding to Code Class MC components.

G/C Specification SP-527-4549-00 requires that impact tested weld material be used for all ASME Class MC work. The installation contractor questioned the necessity for its use to weld the anchor and barrier plates to the containment Class MC penetration sleeves since the plates themselves were not impact tested. Subsequent investigation by G/C engineering revealed that not only was impact testing (or normalization) not imposed by the specification, but that 4 of the 11 heats used to fabricate the plates yielded unsatisfactory results when impact testing was performed.

The affected spool piece assemblies were returned to the fabricator for repair or replacement with plate material from acceptable heats.

Specification SP-527-4549-00 was revised (Revision XI) to include a requirement that "materials which are permanently attached by welding to Class MC components shall meet the requirements of Section NE 4431 of the Code." However, the specification did not identify: (1) which materials were affected; (2) which materials were permanently attached by welding to Class MC components; and (3) that the containment penetration sleeves (supplied by a different manufacturer) were Class MC components.

G/C engineering stated that the specification will be revised (Revision XII) to specifically require the anchor and barrier plates to be furnished in accordance with paragraph NE-4431 of the Code. The related G/C design drawing 04-4549-B-312-633 will be revised (revision F) to clearly identify the Code Class of all affected components and their interfaces (weldments).

The inspector noted that the current design specification and the as-built condition of the penetration assemblies are in contrast with paragraphs 3.8.2.1.6.a.8 and 3.8.2.1.6.a.7 of the Perry PSAR and FSAR (respectively) which state that "Mechanical penetration primary barriers are designed, fabricated, tested and inspected in accordance with ASME Code, Section III, Class MC (Subsection NE)."

Two nonconformances were identified in this area of the inspection (see B.1 and B.2 above).

3. Special inspection to determine the cause, significance, and design corrective action taken by G/C on a Tennessee Valley Authority 10 CFR Part 50.55(e) report that the snubber for seal bypass piping of a Sequoyah, Unit 2, reactor coolant pump was misoriented.

   Review of available documentation and interviews with cognizant personnel indicate that as a result of a design error, the snubber for the 3/4 inch bypass piping for the number one seal of reactor coolant pump number three was installed in a direction to retard pipe motion opposite to that observed during hot functional testing.

   The safety concern was that pipe motion in a direction opposite to that for which the snubber was oriented could exceed the working range of the snubber and significantly increase the stress in the piping and could cause the pipe to break.

   The snubber at 08-17-RO node 21A on TVA isometric drawing 47K-406-128 and hanger number 2-CVTH-934 were designed as a result of stress calculation/piping analysis TVA-0600154-08-17 performed by G/C on December 8, 1980. The analysis was requested by TVA to update an earlier EDS Nuclear analysis to include the effects of newly specified seismic, thermal, and containment radial pulse pressure movement, displacement, and acceleration histograms.

   The piping stress analyst apparently reversed the positive direction of the X-axis of the local coordinate system, from the conventional direction, to simplify the analysis at pipe location 08-17-RO node 21A. The analyst did not note the change on the system stress isometric drawing as required by TVA procedures. Further, the checker failed to detect and record the error during the required check of the system design analysis.

   G/C corrected the calculation on May 1, 1981, revised drawing 47K-406-128, and transmitted both to TVA in May 1981.

   None of the TVA procedures nor calculation packages were available at the Reading Office for examination by the inspector. However, a documented review by G/C personnel on October 16, 1981, of approximately twenty percent of the calculations performed by the G/C Oak Ridge Engineering Office, did not reveal any additional examples of this type of error.

Examination of design verification records for V. C. Summer piping stress analyses/calculations SCY-11 and CS-18 that were performed and checked at the Reading Office revealed no further examples of this type of error. However, the checker did identify 11 items in SCY-11 and 3 in CS-18 that required resolution prior to issue of the calculations.

The undetected error in TVA calculation 0600154-08-17 appeared to be an isolated event.

One nonconformance was identified in this area of the inspection (see B.3 above).

ORGANIZATION: GILBERT/COMMONWEALTH
UTILITIES GROUP
READING, PENNSYLVANIA

REPORT NO.: 99900525/82-01	INSPECTION DATE(S) 2/9-12/82	INSPECTION ON-SITE HOURS: 32

CORRESPONDENCE ADDRESS: Gilbert/Commonwealth
Utilities Group
ATTN: Mr. H. Lorenz, Group Vice President
Post Office Box 1498
Reading, PA 19603

ORGANIZATIONAL CONTACT: Mr. N. R. Barker, Vice President, QA
TELEPHONE NUMBER: (215) 775-2600

PRINCIPAL PRODUCT: Architect Engineering and Consulting Services

NUCLEAR INDUSTRY ACTIVITY: The total effort committed to domestic nuclear activities at the Reading facility is approximately 34% of the 2700 person staff of the Utilities Group. Major projects include Perry Units 1 and 2, V. C. Summer, Unit 1, and Three Mile Island, Unit 1 Restart.

ASSIGNED INSPECTOR: C J Hale /for 3-18-82
D. F. Fox, Reactor Systems Section (RSS) Date

OTHER INSPECTOR(S):

APPROVED BY: C J Hale 3-18-82
C. J. Hale, Chief, RSS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B; Topical Report GAI-TR-106; and the FSAR for the V. C. Summer Nuclear Station, Unit 1.

B. SCOPE: Special design inspection of the V. C. Summer nuclear power station analysis for safe shutdown capability in the event of the postulated rupture of any high or moderate energy line outside of the reactor containment.

PLANT SITE APPLICABILITY:

Virgil C. Summer Nuclear Power Station, Unit 1, Docket; 50-395.

ORGANIZATION: GILBERT/COMMONWEALTH
UTILITIES GROUP
READING, PENNSYLVANIA

REPORT NO.: 99900525/82-01	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATIONS:

None

B. NONCONFORMANCES:

Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 7:19 of the V. C. Summer Project Management Manual, a Design Verification Status Report, dated February 4, 1982, prepared by the Applied Engineering Analysis discipline, did not identify, and therefore did not indicate the status of, safety-related calculation 2.7.1.2 (Main Steam and Feedwater Ruptures Outside Containment). Further, the documented quarterly reviews of the Design Verification Status Report by the Project Engineer apparently were not effective in that the latest report in which the referenced calculation was identified, and its status indicated, was dated January 15, 1976.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Open) Nonconformance (81-03): Revision XI of specification SP-527-4549-00 does not specifically address the material requirements for the Perry, Units 1 and 2, anchor and barrier plates of containment mechanical piping penetration assemblies as committed in G/C 10 CFR Part 21 report to NRC dated April 28, 1981.

   Action on this item was deferred to a future inspection pending receipt of the G/C response to this item.

2. (Open) Nonconformance (81-03): Design specifications 597-044461-00, 592-044461-00 and 527-4549-00 did not include all the design input data required by Section 3.0 of ANSI N45.2.11. Action on this item was deferred to a future inspection pending receipt of the G/C response to this item.

ORGANIZATION: GILBERT/COMMONWEALTH
UTILITIES GROUP
READING, PENNSYLVANIA

REPORT NO.: 99900525/82-01	INSPECTION RESULTS:	PAGE 3 of 4

3. (Open) Nonconformance (81-03): A piping system analyst did not identify, nor note on the affected piping system stress isometric drawing 47K-406-128, that the spatial orientation of the X-axis used in stress calculation 0600165-08-17 was reversed from the conventional orientation as required by TVA Procedures CEB-SQN-100 and SQN-DC-V-13.3. Further, the checker failed to detect and record the error as required by the Sequoyah Nuclear Power Plant Checking Procedure. Action on this item was deferred to a future inspection pending receipt of the G/C response to this item.

4. (Open) Nonconformance (81-03): Mechanical Department calculation 13.19 dated June 11, 1981, did not note the specific purpose or objective of the calculation; nor did it identify the source(s) of the negative three PSI pressure differential and the atmospheric pressure variation that were used as design inputs to the calculation as required by 4.1.4 of V. C. Summer procedure 4.2.1. Action on this item was deferred to a future inspection pending receipt of the G/C response to this item.

E. OTHER FINDINGS OR COMMENTS:

Design Inspection - Branch Technical Position Papers and sections of the Virgil C. Summer, Unit 1, FSAR pertaining to postulated piping failures in fluid systems and accident analyses were reviewed to determine the commitments, design bases, and design measures employed by G/C to assure that the Virgil C. Summer (VCS) nuclear power station can be safely shutdown in the event of the postulated rupture of any high or moderate energy line outside of the reactor containment.

One technical report, 4 analytical models, 11 drawings, 18 calculations, 11 design verification records, and other related documentation were examined by the NRC inspector to verify implementation of commitments.

The NRC inspector determined that the documentation to support the conclusion in section 3.6.2.5.3 of the VCS FSAR, (which states in part that "The analytical results show that no essential system or component (required for safe plant shutdown) is rendered incapable of performing its necessary functions as a result of any postulated pipe rupture") was not filed such that it was readily retrievable.

ORGANIZATION: GILBERT/COMMONWEALTH
UTILITIES GROUP
READING, PENNSYLVANIA

REPORT NO.: 99900525/82-01	INSPECTION RESULTS:	PAGE 4 of 4

All G/C analyses relating to this subject appear to be performed, documented, and filed by the affected disciplines; i.e., structural, mechanical, electrical, instrumentation and control, applied engineering analyses, etc., by subject matter. Time did not permit the inspection of the documentation available to support the FSAR statement on safe shutdown capability except in a very limited area.

In the area inspected, the NRC inspector noted differences between the VCS FSAR commitments and the current NRC guidance on protection against postulated piping ruptures in fluid systems outside containment with regard to coincidence and size of postulated longitudinal breaks in high energy piping systems, definition of pipe motion associated with "pipe whip," and consideration of "plastic hinges" in piping and restraint design and analysis. Further, the NRC inspector noted that certain analyses did not specifically reference the supporting computer analysis run(s) and were difficult to review without recourse to the originator due to lack of detail and documentation of assumptions.

This area will be further inspected during future inspections.

ORGANIZATION: GOULD, INC., INDUSTRIAL CONTROLS DIVISION
FINKSBURG, MARYLAND

REPORT NO.: 99900279/81-01	INSPECTION DATE(S): 11/17-19/81	INSPECTION ON-SITE HOURS: 22

CORRESPONDENCE ADDRESS: Gould, Inc.
Industrial Controls Division
ATTN: Mr. G. Kennedy
Operations Manager
2002 Bethel Road
Finksburg, MD 21048

ORGANIZATION CONTACT: Mr. R. P. Wathen, Manager, Quality Assurance
TELEPHONE: (301) 876-2214

PRINCIPAL PRODUCT: Panel boards, switch boards, special controls, and 480 volt motor control centers.
NUCLEAR INDUSTRY ACTIVITY: Forty percent of the total activity.

ASSIGNED INSPECTOR: I Barnes for W. E. Foster, Reactive Inspection Section (RIS) 12-31-81 Date

OTHER INSPECTOR(S):

APPROVED BY: I Barnes I. Barnes, Chief, RIS 12-31-81 Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21 and 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made as a result of: (1) identification of potential binding problems with National Electrical Manufacturers Association Size 3 motor control starters and contactors at the Watts Bar Nuclear Power Station, Units 1 and 2; (2) failure of Type J, 15 and 30 amperes control transformer fuses in the 480 volt motor control centers supplied to the Bellefonte Nuclear Power Station, Units 1 and 2; (3) initiation of the

SCOPE CONTINUED

supply feeder trip sequence due to an erroneous undervoltage condition detected by the alternating current relays used in the 6.9 kilovolt switchgear supplied to the Bellefonte Nuclear Power Station, Unit Nos. 1 and 2; and (4) assembly problems with Type JG, JL and KM circuit breakers. Additionally, the following areas were inspected: (1) follow up on nonconformances; (2) implementation of 10 CFR Part 21; (3) organization (limited); (4) manufacturing process control (limited); and (5) change control (limited).

INSPECTION RESULTS:

A. VIOLATIONS:

Contrary to paragraph 21.6 of 10 CFR Part 21, posting of 10 CFR Part 21, Section 206 of the Energy Reorganization Act of 1974, adopted procedures or an appropriate notice, had not been accomplished at the Westminster Operation of the Industrial Control Division. The Westminster Operation assembles starters and contactors that are used in motor control centers which are assembled and shipped from the Finksburg Operation.

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraphs 4.4 and 4.5 of Field Quality Instructions No. 15.31, Revision 0, dated September 28, 1979, the Certification of Installation section of the file copy of the Form QA-37R, had not been completed for replacement, on January 17-18, 1980, of Size 3 carriers at the Midland Nuclear Power Station. Thirteen QA file copies of Form QA-37R were reviewed.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraph 5.5.2, of Quality Assurance Procedure 12.1, Revision 6, and its Change Notice No. 1, figure 12.1-2, the week in which equipment is to be calibrated had not been entered on the Scheduled Work Assignment/Routine Record (Form No. 00358) for the following equipment; (1) A. C. Current Source Tester, No. C-140, (2) Welding Machines, Nos. P572, P573, P574 and P575, and (3) Test Panel No. C-167. Ten Forms No. 00358 were reviewed.

C. UNRESOLVED ITEM:

The description of the organization in Quality Assurance Procedure 1.0, dated September 28, 1979, is different from that identified in Section 1.0 of the Quality Assurance Manual, Revision 5, dated January 15, 1981, and its Change Notice No. 1, issued November 5, 1981. As an example, the

latter document indicates that the Quality Control Department reports directly to the Quality and Technical Services Manager while the former indicates that the Quality Control Department reports directly to the Manufacturing Manager.

As a result of this apparent conflict, the inspector could not determine which document accurately reflected the organization. The inspector was informed that revision of the Quality Assurance Procedure is underway.

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Deviation (79-01): Several calibration cards had been marked, "Calibration O.K." as opposed to specific data.

   The inspector reviewed ten Scheduled Work Assignment/Routine Record, Forms No. 00358, and verified that the committed corrective action had been taken. One of these was on a standard and included specific data; also, a certificate on a standard with specific data from an independent calibration laboratory was reviewed.

2. (Closed) Deviation (79-01): Nonconforming components were being discarded into metal baskets or bins without identifying the receptacles as collectors for scrap materials.

   The inspector verified that: (1) nonconforming items are delivered to the Receiving Inspection Hold Area; and (2) receptacles for collection of scrap materials had been identified as such.

E. OTHER FINDINGS OR COMMENTS:

1. Follow up on Regional Requests

   a. The Tennessee Valley Authority (TVA) filed a potential construction deficiency report with the Nuclear Regulatory Commission, Region II pertaining to possible seizure or binding of the carrier assembly within the support plate of the stationary contact assembly of National Electrical Manufacturers Association (NEMA) size 3 motor starters and contactors. The defective hardware had been supplied to the Watts Bar Nuclear Power Station, Unit Nos. 1 and 2. Prior to this notification, the manufacturer had issued a 10 CFR Part 21 report and the Office of Inspection and Enforcement had issued a Circular.

      The deficient condition resulted because the dimension of the carriage cavity was not taken into account at the time a new mold was fabricated. Consequently, a wedge rather than a

straight configuration resulted causing restricted operation of the carriage, in some cases. The improper dimension was not detected during tool proofing or first piece inspection. The inspector was informed that the dimension (1.392-1.400) had been identified as a critical dimension and was being checked on a sample basis at receiving inspection.

Initially, the inspector could not determine that adequate preventive measures had been taken because inspection of the identified critical dimension had not been annotated in inspection records. Prior to the close of this inspection, the aforementioned and other critical dimensions had been made obvious on drawings used by inspection personnel. The Certification of Installation section of the Statement of Conformance (Form QA-37R) had not been completed for replacement of the Size 3 carriers at the Midland Nuclear Power Station. With this exception, adequate corrective actions and preventive measures had been taken.

b. TVA filed a potential construction deficiency report with the Nuclear Regulatory Commission, Region II pertaining to failure of Type J, 15 and 30 amperes control transformer fuses in 480 volt motor control centers during inital energizing and upon re-energizing following an outage. The deficiency was observed in hardware supplied to the Bellefonte Nuclear Power Station, Units 1 and 2.

The inspector was informed that TVA was the only purchaser that used fuses in the control transformer circuits; therefore, it can be concluded that generic aspects had been assessed. It appears that adequate corrective action had been taken. The cause of the problem could not be determined because:

(1) The available documentation (correspondence) on fuse selection was contradictory, and (2) TVA drawings supplied with the purchase order were not available for review. This area of the inspection will remain open.

c. TVA filed a construction deficiency report with the Nuclear Regulatory Commission, Region II pertaining to initiation of the supply feeder trip sequence due to an erroneous undervoltage condition detected by the alternating current relays used in the 6.9 kilovolt switchgear supplied to the Bellefonte Nuclear Power Station, Units 1 and 2. The report indicated that the hardware "was designed and supplied by Gould-Brown Boveri, Westminster, Maryland." Currently the company's name is Gould, Inc. and personnel interviewed stated that they have no knowledge of this hardware.

The inspector will follow up on this item at the appropriate location, when that determination has been made.

d. A copy of a Telephone Report was provided to the Nuclear Regulatory Commission (NRC) Region IV by the NRC, Region I. The report addressed deficient conditions of Type KM, JG and JL circuit breakers manufactured by Gould, Incorporated. The inspector was informed that this equipment is manufactured in Philadelphia, Pennsylvania by the Circuit Protection Division (CPD) and the QA Manager of the Finksburg Operations is desirous of accompanying the NRC when an inspection of the CPD is conducted. The inspector informed the QA Manager that he would be kept apprised of developments regarding said inspection.

2. Programmatic Areas

a. Implementation of 10 CFR Part 21 - The inspector noted that the purchase order forms contained a provision for invoking 10 CFR Part 21. Three outgoing purchase orders were reviewed to verify that the requirement had actually been invoked; it had. Also, posting was observed at the Finksburg Operations. Personnel interviewed at the Westminster Operations indicated that posting had not been accomplished for that facility. The inspector was also apprised of the reporting by the Westminster Operations to the Finksburg Operations, regarding 10 CFR Part 21. The Westminster facility assembles starters and contactors which are used in motor control centers that are assembled and shipped from the Finksburg facility. In view of this relationship, the inspector considers the Westminster facility as another assembly operation of the Finksburg facility.

b. Change control, organization, and manufacturing process control - These activities were limited to review of program establishment; which was verified by a review of: (1) 11 sections of the QA Manual; (2) 32 QA Procedures; and (3) 7 QC Instructions. Implementation was limited to one task in progress and its attendant documentation.

ORGANIZATION: LAMCO INDUSTRIES, INC.
El CAJON, CALIFORNIA

REPORT NO.: 99900114/81-02	INSPECTION DATE(S): 12/7-11/81	INSPECTION ON-SITE HOURS: 24

CORRESPONDENCE ADDRESS: Lamco Industries, Inc.
ATTN: Mr. R. R. Laser
President
1596 North Johnson
El Cajon, CA 92020

ORGANIZATION CONTACT: Mr. S. Eggleston, Director, Quality Assurance
TELEPHONE NUMBER: (714) 440-2002

PRINCIPAL PRODUCT: Class 1, 2, and 3 Vessels, Piping and Components.

NUCLEAR INDUSTRY ACTIVITY: Commercial Nuclear production of Lamco Industries, El Cajon, California plant totals 30% of total company production. Fifty-one nuclear contracts are presently in-house for current and future production.

ASSIGNED INSPECTOR: J. W. Sutton, Components Section (CS) — 2-10-82 Date

OTHER INSPECTOR(S):

APPROVED BY: U. Potapovs, Acting Chief, CS — 2-10-82 Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B, and other applicable regulations.

B. SCOPE: Weld Control, 10 CFR Part 21 Inspection Nonconformance/Corrective action, Completed Products Testing, Manufacturing Control, Machining, and review of vendor activities.

PLANT SITE APPLICABILITY:

Not identified.

ORGANIZATION: LAMCO INDUSTRIES, INC.
EL CAJON, CALIFORNIA

REPORT NO.: 99900114/81-02	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS:

1. 10 CFR Part 21 Inspection - The inspector reviewed Lamco Industries, Inc., written policy for the reporting of identified component defects that could be reportable under 10 CFR Part 21 requirements.

   The inspector reviewed Lamco's revised instruction letter issued July 1981, and reporting procedure QA 781. Both items were found to be posted as required by posting instructions. The inspector determined that the requirements of reporting and posting under 10 CFR Part 21 have been complied with as required by regulations.

2. Nonconformance/Corrective Action - The inspector reviewed Lamco's QA Manual, Sections N15 and N16, 31 Rejection Notices (RN), and 18 Rework Travelers and associated documentation to determine compliance to QA/QC procedures. The corrective action taken to prevent recurrence was examined for implementation. Segregation areas, designated for storage of nonconforming items, were inspected. Relative to the documents examined, the inspector determined that activities were in conformance with the QA program requirements and were being implemented as required.

3. Weld Control - The inspector reviewed Lamco's QA Manual, Section N10, procedure 4.0 welding control, four weld procedures, six available work order travelers, five welder qualification records, weld material issuance records, and observed welding operations in progress.

ORGANIZATION: LAMCO INDUSTRIES, INC.
EL CAJON, CALIFORNIA

REPORT NO.: 99900114/81-02	INSPECTION RESULTS:	PAGE 3 of 3

As a result of the review of welding documentation amd observation of work in progress, the inspector determined that, control of welding during the manufacturing process was in compliance with the QA/QC Program commitments.

4. Manufacturing Control-Machining - The inspector reviewed Lamco's QA Manual, Section N6 Instructions and Procedure Control, and witnessed machining work in progress for three work orders to determine if work was being performed as indicated on the work order and specified drawings. Measuring and test gauges were checked for calibration and use.

   As a result of the review of the documentation, the inspector determined that machining operations were being performed as required by Lamco's QA/QC requirements.

5. Completed Products-Testing - The inspector reviewed two travelers, work orders, data packages and procedures to determine if completed products were being tested and if the results were being documented as required by Lamco's QA Manual, Sections N9-N10 and N11. The inspector witnessed the testing of one 4-loop head lift rig.

   As a result of witnessing the test and the review of documentation, it was determined that the testing and documentation of completed products was in compliance with Lamco's QA/QC procedures and instructions.

ORGANIZATION: LIMITORQUE CORPORATION
LYNCHBURG, VIRGINIA

REPORT NO.: 99900100/82-01	INSPECTION DATE(S): 1/5-8/82	INSPECTION ON-SITE HOURS: 25

CORRESPONDENCE ADDRESS: Limitorque Corporation
ATTN: Mr. T. Mignogna
President
5114 Woodall Road
Lynchburg, Virgina

ORGANIZATION CONTACT: Mr. K. Groome, QA Manager
TELEPHONE: (804) 528-4400

PRINCIPAL PRODUCT: Manual and Motor Operated Valve Actuators

NUCLEAR INDUSTRY ACTIVITY: Limitorque currently has contracts to furnish valve actuators for several nuclear sites which is less than 10% of its business.

ASSIGNED INSPECTOR: W. M. McNeill, Components Section (CS) — Date: 2/12/82

OTHER INSPECTOR(S):

APPROVED BY: U. Potapovs, Acting Chief, CS — Date: 2-23-82

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: Manufacturing process controls; change controls; and nonconformances and corrective actions.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to the QA Manual, Section V, paragraph A.1, and Criterion V of Appendix B to 10 CFR Part 50, the construction of actuators on a recent shop order was not controlled by the Bill of Materials in that the actuators were built and shipped with a different Unit Ratio, Output RPM, Stem Diameter, Stem Pitch and Lead, Stem Nut, Motor Pinion, and Worm Shift Gear than that identified on the Bill of Material.

2. Contrary to the QA Manual, Section VII, paragraph A.6(1), and Criterion V of Appendix B to 10 CFR Part 50, assembly inspection records were not properly maintained in that both Inspection Check-off sheets for 3G0185 item A serial nos. 17, 20, 21, 22, 23 and 24 indicated a "hammer blow" feature had been verified, although the completed units did not have such a feature.

3. Contrary to the QA Manual, Section I, paragraph A.1, and Criterion V of Appendix B to 10 CFR Part 50, it was noted that there is no Quality Assurance Manual requirement that procedures, drawings, etc., include accept/reject criteria. For example, Bench Testing procedures do not identify the accept/reject criteria for actuator Output RPM tests.

4. Contrary to the QA Manual, Section II, paragraph E.4, and Criterion V of Appendix B to 10 CFR Part 50, the Bill of Material on a recent job did not contain a special inspection peculiar to that customer, namely the use of a customer supplied checklist (BV-110).

5. Contrary to the QA Manual, Section X, paragraph A.3.b(4), and Criterion V of Appendix B to 10 CFR Part 50, upon completion of rework, Variation Reports 59595, 59332 and 59248 did not note that the rework was acceptable.

D. OTHER FINDINGS OR COMMENTS:

1. Manufacturing Process Controls - A recent nuclear order (3G0185) for actuators was reviewed in detail. The Master File of manufacturing information and inspection records was reviewed. Forty-Six of the 58 actuators on order were shipped during the inspection. The compliance of these actuators to the Bill of Material and Engineering Change Notices was inspected and a nonconformance identified. Late in 1981, a customer change to these actuators was made; however, the change notice procedure was not followed. Therefore, the shipped actuators complied with the customer requirements but not the internal Limitorque documents (see B.1 above.).

The assembly inspection and testing was inspected. The use of checklists was inspected and a nonconformance identified (see B.2 above.). A number of clerical type errors were found on inspection records.

The conformance of both inspection and testing to the Quality Control Procedures was inspected and two nonconformances identified. Bench Testing is done to verify the proper assembly of all the gears and motor in an actuator. It was noted that the procedures lacked accept/reject criteria (see B.3 above.). A special final inspection to a customer supplied checklist was being performed by Limitorque. However, it was noted that this inspection activity was not identified on the Bill of Materials. This was identified as a nonconformance (see B.4 above.).

2. Change Controls - A recent nuclear order and its changes were reviewed in detail. The Order Entry function to establish an Order Data Sheet and Bill of Material was verified. The Routing Sheets of applicable changes were verified. The identification and designation of the actuator and its components was inspected and found to follow the established selection procedures. Actuators were built to an established design from an in process stock of components for both nuclear and nonnuclear applications. Changes were found to follow the established procedures except for the nonconformance previously noted (see B.1 above.).

3. Nonconformances and Corrective Actions - Fifteen nonconformances were reviewed which had been identified on the current nuclear order to date. The identification of nonconforming material was verified. The dispostion and review of nonconformances was verified. Follow up of rework/repair on nonconforming parts failed to follow established procedures. A nonconformance was identified in this area (see B.5 above.).

ORGANIZATION: METAL BELLOWS CORPORATION
CHATSWORTH, CALIFORNIA

REPORT NO.: 99900394/81-02	INSPECTION DATE(S): 11/30-12/3/81	INSPECTION ON-SITE HOURS: 28

CORRESPONDENCE ADDRESS: Metal Bellows Corporation
ATTN: Mr. J. C. Shafer
Quality Assurance Manager
20977 Knapp Street
Chatsworth, CA 91311

ORGANIZATION CONTACT: Mr. J. C. Shafer, Quality Assurance Manager
TELEPHONE: (213) 341-4900

PRINCIPAL PRODUCT: Flexible Metal Hose assemblies, Pulsation Dampeners, Pressure Vessels, Expansion Joints and Penetrations.
NUCLEAR INDUSTRY ACTIVITY: Metal Bellows Corporation, has 20 commercial nuclear jobs representing approximately 20% of the total workload.

ASSIGNED INSPECTOR: C J Hale/lbr — 12-29-81
Ross L. Brown, Components Section (CS) — Date

OTHER INSPECTOR(S):

APPROVED BY: C J Hale /lbr — 12-29-81
U. Potapovs, Acting Chief, CS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B; 10 CFR Part 21; and other applicable standards.

B. SCOPE: Management meeting and implementation of 10 CFR Part 50, Appendix B, including control of nonconformances and corrective actions, change control, manufacturing process control, and 10 CFR Part 21 inspection.

ORGANIZATION: METAL BELLOWS CORPORATION
CHATSWORTH, CALIFORNIA

REPORT NO.: 99900394/81-02	**INSPECTION RESULTS:**	**PAGE** 2 of 2

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Control of Nonconformances and Corrective Actions - Review of the Material Review Board Action Log, Corrective Action Reports Log, 10 Rejection Reports, 6 Corrective Action Reports, and the monthly graphs of nonconformance trends verified that the discrepant conditions were identified, dispositioned, cause, and corrective action documented and reported to the top management including the Vice President as required by the Quality Assurance Manual (QAM), Section 10.

2. Manufacturing Process Control - Review of Manufacturing Operation Sheets (MOSs) for four Metal Bellows Corporation (MBC) jobs and six document control records verified that the pertinent manufacturing steps were identified and initialed signifying completion and the assigned witness/hold points were signed off as required by QAM. Section 4. Review of six document control records, and four pre-printed master MOSs verified conformance with paragraph 2.3 of the Engineering Change Order Procedure.

3. Change Control - Review of 10 engineering change orders, 2 engineering change requests, 2 preliminary engineering change orders, and 4 drawings verified that change identification and justification, change evaluation and approval, translation of the change(s) to the appropriate document(s), and distribution and recall control are in conformance with the requirements of the quality assurance manual and operating procedures.

4. 10 CFR Part 21 Inspection - Review of MBC Procedure Manual, Section 3, Procedure No. 8, Notice to employees, and two employees bulletin boards, verified compliance with the regulatory requirements.

ORGANIZATION: NPS INDUSTRIES, INC.
SECAUCUS, NEW JERSEY

REPORT NO.: 99900763/81-01	INSPECTION DATE(S) 11/17-18/81	INSPECTION ON-SITE HOURS: 16

CORRESPONDENCE ADDRESS: NPS Industries, Inc.
ATTN: Mr. J. F. Barton
President
One Harmon Plaza
Secaucus, New Jersey 07094

ORGANIZATIONAL CONTACT: Mr. Leo Hovi, Senior Vice President
TELEPHONE NUMBER: (210) 865-6550

PRINCIPAL PRODUCT: Component Supports

NUCLEAR INDUSTRY ACTIVITY: NPS Industries, Inc., at their Secaucus, New Jersey, facilities, engineers and designs component supports and other equipment for use in nuclear power plants. Current projects include major contracts with domestic nuclear plants comprising about 25% of the activity. Other nuclear contracts and contracts for foreign nuclear plants comprise about 45% of the activity and non-nuclear contracts comprise the remaining 30% of the activity.

ASSIGNED INSPECTOR: C J Hale /for/ 2-16-82
D. F. Fox, Reactor Systems Section (RSS) Date

OTHER INSPECTOR(S): L. E. Ellershaw, Reactive Inspection Section
J. I. Tapia, Engineering and Materials Section

APPROVED BY: C J Hale 2-16-82
C. J. Hale, Chief, RSS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21 and 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made in concert with an inspection of Nuclear Power Services, Inc., as a result of concerns expressed to the NRC pertaining to possible errors and deficiencies in the design of component supports which could result in the failure of supports being provided to the Texas Electric Generating Company's Comanche Peak Steam Electric Station, Units 1 and 2. In addition to the specific identified concerns the inspection also included a management meeting.

PLANT SITE APPLICABILITY:

While the activities of this organization relate to numerous plant sites, this inspection was limited to the activities concerning Docket Nos. 50-445 and 50-446.

ORGANIZATION: NPS INDUSTRIES, INC.
SECAUCUS, NEW JERSEY

REPORT NO.: 99900763/81-01	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATIONS:

1. Contrary to paragraph 21.6 of 10 CFR Part 21, the copy of 10 CFR Part 21 posted in the NPS Industries, Inc. (NPSI), facilities examined during this inspection was not the current issue.

2. Contrary to paragraph 21.31 of 10 CFR Part 21, procurement documents for basic components subject to the Regulations, issued from January 6, 1978, to August 8, 1980, did not specify that the provisions of 10 CFR Part 21 apply.

B. NONCONFORMANCES :

Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Sections 2.0.5 and 17.0.3 of the NPSI QA Manual, training records were not either stored in separate and secure storage locations or in a single fire and water proof area.

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Management Meeting - The purpose, scope, and nature of the Licensee Contractor and Vendor Inspection Program were reviewed with the President of NPSI and key management personnel at the beginning of the inspection. The concerns expressed to NRC with respect to possible errors and deficiencies in the design of component supports for the Comanche Peak Steam Electric Station (CPSES) were outlined and the basis for the inspection enumerated. The format, content, dissemination, and publication of NRC inspection reports, and NPSI responses, thereto, were discussed in detail.

2. 10 CFR Part 21 Inspection - NPSI 10 CFR Part 21 implementing procedures NPSI/NRC-01 (Reportable Defects and Noncompliance - Nuclear Projects) and NPSI/NRC-02 (Procurement Documents - Compliance with 10 CFR Part 21) were reviewed for congruency with 10 CFR Part 21 Regulations. Two processed safety concern files and twenty purchase orders, and changes thereto, were examined to verify implementation. Two violations were identified in this area of the inspection. See A above.

ORGANIZATION: NPS INDUSTRIES, INC.
SECAUCUS, NEW JERSEY

REPORT NO.: 99900763/81-01	INSPECTION RESULTS:	PAGE 3 of 4

With respect to Violation A.1, corrective action was taken during the inspection in that the posted copy of 10 CFR Part 21, dated November 9, 1979, was replaced with the current version, dated July 24, 1981.

With respect to Violation A.2, procurement documents for basic components issued after August 8, 1980, specify that the provisions of 10 CFR Part 21 apply, where applicable. Furthermore, change notices specifying that the provisions of 10 CFR Part 21 apply have been issued for a few, but not the majority of the purchase orders for basic components that were issued from January 6, 1978, to August 8, 1980.

Except as noted herein, the committed program was being implemented in the areas examined.

3. Special inspection to determine the safety significance of concerns expressed to the NRC that possible errors and deficiencies in the design of component supports could result in failure of the supports at the Comanche Peak Steam Electric Station (CPSES), Units 1 and 2.

Review of available documentation, and interviews with cognizant personnel, indicate that NPSI was contracted by Texas Utilities Generating Company (TUGCO), via TUGCO purchase order CP-0046A.1, dated January 16, 1978, to design, fabricate, and deliver hangers and supports and to provide associated engineering services, to CPSES, Units 1 and 2. All safety-related hangers and supports were to be designed and fabricated in accordance with Gibbs & Hill, Inc., (G&H), specification 2323-MS-46A. Non-safety related hangers and supports were to be provided under a separate TUGCO purchase order and G&H specification.

NPSI subcontracted the detailed design and analysis of both safety and nonsafety-related hangers and supports to Nuclear Power Services, Inc. (NPS), a separate entity of the NPS Corporation, via NPSI purchase order 30-086, dated September 11, 1978. All final design drawings were to be generated by NPS using NPSI identification and logo on the drawings.

ORGANIZATION: NPS INDUSTRIES, INC.
SECAUCUS, NEW JERSEY

REPORT NO.: 99900763/81-01	INSPECTION RESULTS:	PAGE 4 of 4

Sufficient documents were not available at the NPSI facilities to permit the inspectors to determine if errors and deficiencies did in fact exist in final design documents, their cause, the extent of their proliferation into drawings that have been issued for construction, and their safety significance.

NPS was therefore inspected in concert with NPSI and the results are reported in NRC inspection report 99900531/81-01. The inspector noted, at the joint NPSI/NPS exit meeting held in the NPS facilities on November 20, 1981, that a substantial number of significant deficiencies exist in the NPS program for personnel qualification, design control, and quality assurance. Most of the deficiencies existed since 1979 and should have been identified during the audits of NPS conducted by NPSI, if the NPSI vendor surveillance activities were effective in the control of quality by subcontractors as required by Criterion VII of Appendix B to 10 CFR Part 50.

One nonconformance was identified in this area of the inspection. See B above.

With respect to the nonconformance, corrective action was initiated during the inspection in that a duplicate set of the identified training records was generated and stored in a separate record storage facility.

Except as noted therein, the committed program was being implemented in the areas examined.

ORGANIZATION: NUCLEAR POWER SERVICES, INC.
SECAUCUS, NEW JERSEY

REPORT NO.: 99900531/81-01	INSPECTION DATE(S) 11/17-20/81	INSPECTION ON-SITE HOURS: 82

CORRESPONDENCE ADDRESS: Nuclear Power Services, Inc.
ATTN: Albert J. Moellenbeck
President
One Harmon Plaza
Secaucus, NJ 07094

ORGANIZATIONAL CONTACT: Mr. Joel Grabie, QA Manager
TELEPHONE NUMBER: (201) 865-6550

PRINCIPAL PRODUCT: Engineering and Design Services

NUCLEAR INDUSTRY ACTIVITY: Engineering and design of component supports and other equipment. Currently about 70% of the work involves domestic nuclear facilities. The total engineering staff consists of approximately 500 engineers, designers, and draftsmen. About 2/3 of the engineering staff is located at field sites and 1/3 at the Secaucus, New Jersey facilities. Major projects include Byron, Comanche Peak, McGuire, Oconee, South Texas Project, and Zimmer.

ASSIGNED INSPECTOR: C. J. Hale for D. F. Fox, Reactor Systems Section (RSS) — Date: 2-16-82

OTHER INSPECTOR(S): L. E. Ellershaw, Reactive Inspection Section
J. I. Tapia, Engineering and Materials Section

APPROVED BY: C. J. Hale, Chief, RSS — Date: 2-16-82

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21 and 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made in concert with an inspection of NPS Industries, Inc., as a result of concerns expressed to the NRC pertaining to possible errors and deficiencies in the design of component supports which could result in the failure of supports being provided to the Texas Electric Generating Company's Comanche Peak Steam Electric Station, Units 1 and 2. In addition to the specific identified concerns the inspection also included a management meeting.

PLANT SITE APPLICABILITY:

While the activities of this organization relate to numerous plant sites, this inspection was limited to the activities concerning the following Docket Nos. 50-445 and 50-446.

ORGANIZATION: NUCLEAR POWER SERVICES, INC.
SECAUCUS, NEW JERSEY

REPORT NO.: 99900531/81-01	INSPECTION RESULTS:	PAGE 2 of 8

A. VIOLATION:

Contrary to paragraph 21.6 of 10 CFR Part 21, posting of either 10 CFR Part 21, Section 206 of the Energy Reorganization Act of 1974 and adopted procedures, or Section 206 and an appropriate notice, had not been accomplished.

B. NONCONFORMANCES:

1. Contrary to Criterion II of Appendix B to 10 CFR Part 50, the NPS quality assurance program did not take into account the need for special skills to attain the required quality, nor provide assurance that all prerequisites for design activities have been satisfied, in that the NPS Personnel Qualification and Verification Program procedure (EPP-2) does not provide sufficient assurance that personnel hired to perform nuclear safety-related design analyses actually possess the special skills and technical qualifications (education, training and experience) needed to perform the analyses in a planned, controlled and correct manner.

2. Contrary to Criterion XVII of Appendix B to 10 CFR Part 50 and Section 17.0.4 of the NPS QA Manual, QA records of indoctrination and training, needed to furnish evidence of activities affecting quality, were not stored either in separate and secure storage locations or in a single fire and water proof area.

3. Contrary to Section 7.0 of ANSI N45.2.11, dated May 1973, documented procedures did not assure that changes to drawing 2S-874B and calculations SC-111-2-31 and SC-265-2E-709 were reviewed for adequacy by authorized personnel, as evidenced by the signatories of unauthorized or unknown individuals on the documents.

4. Contrary to Sections 7.0 and 8.0 of ANSI N45.2.11, drawing 2S-510-R1 was changed on December 26, 1979, without justification and pages 154, 155, 174 and 175 of calculation package SC-265-2E-709 were changed on April 18, 1981, without being reviewed and approved by the same organizations that performed the original review and approval.

5. Contrary to Section 4.2 of ANSI N45.2.11, design analyses were not sufficiently detailed as to purpose, method, and assumptions, in that the basis for sizing the fillet welds used in six examined structural calculations could not be determined by an appropriately qualified NRC inspector, without recourse to the originator.

ORGANIZATION: NUCLEAR POWER SERVICES, INC.
SECAUCUS, NEW JERSEY

REPORT NO.: 99900531/81-01	INSPECTION RESULTS:	PAGE 3 of 8

6. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Sections 1.0 and 3.3 of NPS procedure EPP-2, the Personnel Verification Supervisor did not implement, nor cause to be implemented, all of the established measures to assure that personnel engaged in quality-related activities were qualified to perform the duties to which they are assigned, in that records contained in 16 examined personnel folders were incomplete, inaccurate, noncurrent and were not brought to the attention of the Vice President of Engineering when anomalies in the applicants education or experience qualifications were identified.

7. Contrary to Criterion V of Appendix B to 10 CFR part 50 and QA Manual Section 15.0.4, an NCR was not initiated by the responsible NPS structural group supervisor after the identification and documentation in an inter-office memo dated April 28, 1980, that fillet welds in components supports were undersized with respect to ASME Code requirements.

   As a result, action was not initiated to correct existing drawing and calculation deficiencies or preclude their recurrence as required by Section 9.0 of ANSI N45.2.11.

8. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 17.0.4 of the NPS QA Manual, the TUSI Project QA Record Index did not identify, nor incorporate, NCRs, CARs, Procurement Documents and QA Package Review Checklists as generic project records, even though they were identified as such on the Master List of NPS QA Records.

9. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 3.0.5 of the NPS QA Manual, the design verification of pipe support No. CT-2-007-404-S22R did not assure that the design met the specific design criteria, in that the design verification did not disclose that the tensile and shear force design inputs to the NPS baseplate analysis computer program were transposed.

10. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Subsection NF of Section III of the ASME Code, 15 examined component support drawings specified fillet welds, to be welded at the CPSES Unit 2 site, that were not in accordance with ASME code requirements. All such fillet welds were specified to be ¼", whereas the material was up to 2" thick which requires the use of fillet welds of up to and including 3/8".

C. UNRESOLVED ITEMS:

None

ORGANIZATION: NUCLEAR POWER SERVICES, INC.
SECAUCUS, NEW JERSEY

REPORT NO.: 99900531/81-01	INSPECTION RESULTS:	PAGE 4 of 8

D. OTHER FINDINGS OR COMMENTS:

1. Management Meeting - The purpose, scope and nature of the Licensee, Contractor and Vendor Inspection Program were reviewed with the President of NPS and key management personnel at the beginning of the inspection. The concerns expressed to NRC with respect to possible errors and deficiencies in the design of component supports were outlined and the bases for the inspection were enumerated. The format, content, dissemination and publication of NRC inspection reports, and NPS responses thereto, were discussed in detail.

2. A special inspection was conducted to determine the validity and safety significance of concerns expressed to the NRC that possible errors and deficiencies in the design of component supports could result in failure of the supports at the CPSES Units 1 and 2.

   Review of available documentation and interviews with cognizant personnel, indicate that NPS was contracted by NPS Industries, Inc. (NPSI), a separate entity of the NPS Corporation, via NPSI purchase order 30-086 dated September 11, 1978, to design hangers and supports for CPSES Units 1 and 2. Safety and nonsafety-related hangers and supports were to be designed in accordance with Gibbs and Hill Inc. (G&H) specifications 2323-MS-46A and 2323-MS-46B. All final design drawings were to be generated by NPS using NPSI identification and logo on the drawings.

   The concern was that undetected errors and deficiencies in NPS design calculations and drawings could result in failure of pipe hangers, supports, or whip restraints under accident conditions. The inspectors reviewed applicable NPS contracts, procedures, and available documentation, to determine: (1) if errors and deficiencies did in fact exist in final design documents; (2) their cause, (3) the extent of their proliferation into drawings that have been issued for construction, and (4) their safety significance.

   Errors and deficiencies were found in final design calculations and drawings. Specifically: (1) the tensile and shear forces on the baseplate of pipe support CT-2-007-404-S22R were interchanged in the computer input data to the design analysis of the supports; and (2) certain fillet welds identified on a significant number of component supports for CPSES Unit 2 were not sufficiently sized to meet the minimum requirements of Subsection NF of the ASME Code.

ORGANIZATION: NUCLEAR POWER SERVICES, INC.
SECAUCUS, NEW JERSEY

REPORT NO.: 99900531/81-01	INSPECTION RESULTS:	PAGE 5 of 8

The inspection did not establish that errors and deficiencies were related to a single specific cause. However, the inspectors noted certain programmatic deficiencies in the areas of personnel qualification, design control, design corrective action, QA internal audits and QA Record retention that could have contributed individually, or collectively, to the generation and lack of detection of the errors and deficiencies.

With respect to personnel qualifications, Nonconformances B.1 and B.6 indicate that the procedure for verifying the education and experience of new employees (EPP-2) does not provide sufficient assurance that design personnel actually possess the special skills and technical qualifications (education, training and experience) needed to perform safety-related design analyses in that:

a. Section 6.1 permits the substitution of non-relevent experience for the required Bachelor's or Master's degree.

b. Section 4.3 permits the promulgation of an error, or exaggerated education or experience, when the information obtained from previous employers personnel records is used as the sole basis for confirming that an applicant possesses the minimum qualifications needed to perform a specific design activity.

c. Section 4.9 permits the verification of an applicant's education or experience solely through "personnel knowledge" of an NPS supervisory employee without supporting documentation.

d. Sections 4.3, 4.6 and 4.7 were not being implemented, in that even though the records contained in 16 examined personnel folders indicated that 4 applicants exaggerated their education and experience qualifications, and that the qualifications of 4 others could not be verified, this information was not brought to the attention of the Vice President of Engineering as required.

e. Sections 3.4 and 4.11 were not being implemented, in that the Vice President of Engineering or his designee did not certify one of the applicants as qualified by completing the Technical Review Form, and there were no current Technical Review Forms, for the current job position activities in which 10 of the employees were engaged.

f. Section 6.0 was not being implemented in that the following required records were missing from the 16 examined personnel folders: one authorization for release of information; one request for verification of education; and one request for verification of employment. Furthermore, there were no responses from previous employers to the NPS request for verification of employment of three applicants and the response to another request was not signed by the previous employer.

NPS management stated that their intent was to hire only those individuals that were capable of doing satisfactory work and that in the past several months alone, at least five individuals whose work was not satisfactory were discharged or resigned.

3. With respect to design control, nonconformances identified during the inspection indicate that existing procedures are either not sufficiently definitive, or are not being implemented, in the areas of: (1) accuracy and completeness of calculations; (2) verification of calculations and drawings; (3) design change control; (4) design document review and approval; and (5) security of QA Records.

a. The inspector noted that the initials (BT) of the reviewer of Revision 2 to drawing 2S-874B, dated October 29, 1981, did not correspond to that of any known past or present employee of NPS, and that the initials (TB) of the reviewer of Revision 1 to page 104 of calculation SC-111-2-31, dated December 26, 1979, did not correspond to the initials of TB contained in the approved list of personnel authorized to review and approve design documents.

b. With respect to nonconformance B.9, the transposition of the tensile and shear force design inputs to the calculation did not result in a significant reduction of the structural capacity of the bolted connection of the pipe hanger to the concrete wall. This is due to the fact that the allowable loads for the specified expansion anchors in tension, and in shear, are similar. Nevertheless, the subject nonconformance represents a failure of the design verification process to detect and correct errors in design calculations.

c. With respect to nonconformance B.5, the practice of specifying 1/4" fillet welds was based on the designer's visual inspection

of the loads involved and did not result in a significant safety concern in that for all cases reviewed, the resultant stresses in the welds were found to be relatively low. However, lack of detail in design calculations was exemplified by: (1) the nonexistence of a statement of justification for the adequacy of the welds; and (2) in one case, by a statement that "a one quarter-inch fillet weld would be inadequate" without any statement of corrective action that was needed or taken. Due to the lack of detail, the NRC inspector had to resort to the structural engineering department originators of the calculation for an explanation of the statement. The originators stated that the statement was only meant to apply to a weld of one inch length whereas sixteen inches of weld was provided in the support design.

d. With respect to nonconformance B.10, 20 drawings were reviewed to assure that ASME Code requirements were properly translated into the drawings. Review of 15 drawings pertaining to component supports for CPSES Unit 2 revealed that some of the specified ¼" field fillet welds are undersized, in that the material thickness required fillet welds up to and including 3/8". A brief review of five component support drawings for CPSES Unit 1 did not reveal any evidence of this same discrepancy.

   The NRC inspector noted that the Unit 2 drawings that were reviewed had loadings of up to 1000 lbs. specified.

e. With respect to design corrective action, nonconformance B.7 identified that the existing procedure did not provide sufficient assurance that significant or recurring design deficiencies or errors were identified to the responsible management, nor that appropriate changes were made in the design process and the quality assurance program to prevent their recurrence, as required by Section 9.0 of committed ANSI N45.2.11.

   With respect to QA audits, the inspector noted that most of the deficiencies identified during this inspection, existed since 1979 and should have been identified by an effectively implemented NPS internal audit program.

ORGANIZATION: NUCLEAR POWER SERVICES, INC.
SECAUCUS, NEW JERSEY

REPORT NO.: 99900531/81-01	INSPECTION RESULTS:	PAGE 8 of 8

f. With respect to QA record retention, nonconformances B.2, B.6 and B.8 identified that certain records, needed to furnish evidence of activities affecting quality, or of the important steps which led to the final design, are not being accumulated and maintained with the status of a QA Record.

4. Time did not permit the NRC inspectors to make an accuracte assessment of the extent of the errors and deficiencies in the design process and drawings that were issued for construction. However, the fact that: (1) numerous safety-related component support drawings for CPSES Unit 2 specified undersized fillet welds; (2) six examined safety-related component support calculations were not sufficiently detailed to permit review and verification without recourse to the originator; and (3) approximately 20% of examined calculations were either not checked, not properly revised, or not reviewed and processed as a QA record; is indicative that the errors and deficiencies could exist in other design documents that were not examined by the NRC inspectors.

The specific errors and deficiencies identified by the NRC inspectors did not constitute a safety concern, in that the loadings and resulting stresses on the affected component supports were within the allowables of the ASME Code. However, the fact is that these examples of calculational errors and violations of ASME Code requirements did escape detection and correction by the current NPS design control process and the QA program. Accordingly, the programmatic deficiencies identified during the inspection are of considerable concern to the NRC.

ORGANIZATION: NUCLEAR TECHNOLOGY, INCORPORATED
SAN JOSE, CALIFORNIA

REPORT NO.: 99900517/82-01	INSPECTION DATE(S) 2/22-26/82	INSPECTION ON-SITE HOURS: 29

CORRESPONDENCE ADDRESS: Nuclear Technology, Incorporated
ATTN: Mr. E. Keever
President
6835 Via Del Oro
San Jose, CA 95119

ORGANIZATIONAL CONTACT: Mr. W. E. Booth, Corporate QA Manager
TELEPHONE NUMBER: (408) 629-9800

PRINCIPAL PRODUCT: Engineering Consultant Activities

NUCLEAR INDUSTRY ACTIVITY: Nuclear Technology, Inc., currently has 34 contracts involving 56 domestic reactor units for various engineering consultant activities such as piping analysis, steel containment vessel design and analysis, containment modification design and analysis, mechanical and electrical equipment evaluation/qualification, system/component performance analysis and design, and materials/welding/QA/ISI consulting.

ASSIGNED INSPECTOR: R. H. Brickley 3/16/82
R. H. Brickley, Reactor Systems Section (RSS) Date

OTHER INSPECTOR(S):

APPROVED BY: C. J. Hale 3-16-82
C. J. Hale, Chief, RSS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: QA Program Evaluation

PLANT SITE APPLICABILITY:

Not Identified.

ORGANIZATION: NUCLEAR TECHNOLOGY, INCORPORATED
SAN JOSE, CALIFORNIA

REPORT NO.: 99900517/82-01	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 3.2 of Quality Engineering Procedure (QEP)-010 (Quality Assurance Indoctrination and Training), Form QEP-010.2 had not been completed for two engineering personnel assigned to a project that requires project unique quality requirements, to indicate that this indoctrination had been received.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Sections 2.2 and 4.0 of QEP-016 (Procurement Document Control), procurement document No. CGE-03-182 (TOB-81-275) dated April 22, 1981, to Anchor Darling Valve Company, did not require that they have a Quality Assurance Program consistent with ANSI N45.2-1977 nor did it have a Purchase Authorization Form signed by the Project Manager, Quality Assurance Administrator, and Company Officer.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 7 (Control of Purchased Items and Service) of the Quality Assurance Manual, no evidence exists that the Quality Assurance Administrator performed an evaluation of the quality assurance capabilities of the Anchor Darling Valve Company, a supplier of services under procurement document No. CGE-03-182 (TOB-81-275).

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 4.3.2 of QEP-011 (Audits and Follow-up Corrective Action) the responsible individual has not responded in writing within 30 days for 9 of the Corrective Action Reports examined.

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

QA Program Evaluation - The NUTECH Quality Assurance Manual and its implementing procedures governing the areas of QA program, organization, engineering control, procurement control, QA records, and audits were reviewed to determine that they were consistent with quality and technical commitments to codes, standards, regulations, and guides. The documentation of completed work in these areas, consisting of the corporate

ORGANIZATION: NUCLEAR TECHNOLOGY, INCORPORATED
SAN JOSE, CALIFORNIA

REPORT NO.: 99900517/82-01	INSPECTION RESULTS:	PAGE 3 of 3

organization chart, indoctrination training records for seven individuals, two management evaluations (of the QA Program), three analyses, two specifications, five drawings, two procurement files, two QA records, five internal audit files, two external audit files, and qualification records of four audit team leaders and one auditor, were examined for program inplementation. The four nonconformances documented in B above were identified.

ORGANIZATION: PACIFIC SCIENTIFIC COMPANY
KIN-TECH DIVISION
ANAHEIM, CALIFORNIA

REPORT NO.: 99900255/82-01	INSPECTION DATE(S) 2/8-12/82	INSPECTION ON-SITE HOURS: 26

CORRESPONDENCE ADDRESS: Pacific Scientific Company
Kin-Tech Division
ATTN: Mr. P. A. Hadnagy
QA Manager
1346 S. State College Blvd.
Anaheim, CA 92803

ORGANIZATIONAL CONTACT: Mr. P. A. Hadnagy, QA Manager
TELEPHONE NUMBER: (714) 774-5217

PRINCIPAL PRODUCT: Mechanical Shock Arrestors

NUCLEAR INDUSTRY ACTIVITY: The nuclear component work output of this division is 60%. The division holds a valid ASME Certificate of Authorization to use the "NPT" symbol.

ASSIGNED INSPECTOR: R.E. Oller 3-9-82
R. E. Oller, Reactive Components Program Section (RCPS) Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes 3-22-82
I. Barnes, Chief, RCPS Date

INSPECTION BASES AND SCOPE:

1. BASES: 10 CFR Part 50, Appendix B; and 10 CFR Part 21.

2. SCOPE: This inspection was performed to evaluate the implementation of the vendor's QA program in the areas of: status of previous inspection findings; equipment calibration; procurement document control; procurement source selection; and procurement product acceptance. In addition, a follow-up was made in connection with a 10 CFR Part 21 Report by Bergen Paterson Pipe Support (B-P) concerning inadequate clearances between B-P designed pipe clamps and Pacific Scientific Co. (PSCo) brackets at Callaway Unit No. 1.

PLANT SITE APPLICABILITY: Callaway, Unit No. 1
Docket No. 50-483

ORGANIZATION: PACIFIC SCIENTIFIC COMPANY
KIN-TECH DIVISION
ANAHEIM, CALIFORNIA

REPORT NO.: 99900255/82-01	INSPECTION RESULTS:	PAGE 2 of 5

A. VIOLATIONS

None.

B. NONCONFORMANCES

None.

C. UNRESOLVED ITEMS

None.

D. STATUS OF PREVIOUS INSPECTION FINDINGS

1. (Closed) Nonconformance A (81-01): Failure to correct the internal control document No. SP-344-PS, Revision 0, to include the heat treatment documentation requirements of Bechtel Specification No. 5023-409-2, SCE No. 4129, dated September 1, 1974, as committed to in the two PSCo response letters to the NRC Inspection Report No. 80-01.

   The inspector verified that in accordance with the PSCo response letter dated October 14, 1981, the Standard Practice SP-344-PS was revised (in Revision 3) to include the Bechtel requirement that the location of thermocouples on the parts and placement of the parts in the furnace will be shown on the chart or on an approved sketch.

   To provide preventive action, PSCo performed an internal audit on February 5, 1982, of heat treatment documentation.

2. (Closed) Nonconformance B (81-01): Failure to properly describe the voting membership of the MRB organization in the QA Manual.

   The inspector verified that in accordance with the PSCo response letter dated October 14, 1981, Section 12 of the QA Manual was revised on May 27, 1981, to designate the MRB voting members as being the QA Manager and the Project Engineer, with other departments' personnel functioning on the MRB in an advisory capacity only.

   To provide preventive action, PSCo performed a semiannual review of the QA Manual to identify any required changes and to assure that it is maintained in accordance with the Summer and Winter Addenda of the ASME Code.

ORGANIZATION: PACIFIC SCIENTIFIC COMPANY
KIN-TECH DIVISION
ANAHEIM, CALIFORNIA

REPORT NO.: 99900255/82-01	INSPECTION RESULTS:	PAGE 3 of 5

E. OTHER FINDINGS OR COMMENTS

1. Equipment Calibration: The inspector reviewed Section 14, "Calibration of Measuring and Testing Equipment" of the QA Manual, and PSCo procedure QCIP-ID-19, to verify that a written system was available to control the calibration program.

   Observations were made in the shop of the calibration status of 20 precision measuring tools and devices which were used in acceptance inspection of finished parts for mechanical shock arrestors. These devices consisted of setrings, micrometers, dial bore gages, calipers, plug gages, height gages, surface plates, dial indicators, an optical comparator, a profilometer, and a supermicrometer.

   To verify that the devices were identified in the system and calibrated in accordance with the written program using certified measurement standards with known relationship to National Standards, a review was made of the PSCo Calibration History Record Cards and subcontractor's Certificates of Calibration for the above 20 devices.

   Within this area, no nonconformances or unresolved items were identified.

2. Procurement Document Control: The inspector reviewed Section 6, "Material and Parts Planning" and Section 7, "Preparation and Control of Procurement Documents For Materials, Parts and Special Processing," of the QA Manual, to verify that written measures are available to control procurement documents.

   To verify that the QA program procedures were being properly implemented and that procurement documents suitably included or referenced necessary requirements for materials, parts and services, a review was made of: (a) a Manufacturing Order (traveler) which included purchased services such as machining, heat treating, centerless grinding, passivating and chemical etch marking; (b) a purchase order for raw material and the related PSCo material specification; (c) a raw material code identification log; (d) a supplier's C.M.T.R.; and (e) two purchase orders (one for a recirculating bearing assembly and the other for a thrust bearing kit).

   Within this area of inspection, no nonconformances or unresolved items were identified.

ORGANIZATION: PACIFIC SCIENTIFIC COMPANY
KIN-TECH DIVISION
ANAHEIM, CALIFORNIA

REPORT NO.: 99900255/82-01	INSPECTION RESULTS:	PAGE 4 of 5

3. Procurement Source Selection: The inspector reviewed paragraph 7.1 "Approved Supplier List" of Section 7 of the QA Manual, to verify that written measures were available to control procurement source selection, and assure that it includes integrated action by one or more responsible groups or departments, such as quality assurance, engineering, and purchasing.

   To verify that evaluation and approval of subcontractors include such measures as: onsite survey of capabilities including the quality assurance program, acceptance based on a subcontractor's being a holder of a valid ASME N-type authorization applicable to the items or service to be supplied, a history of subcontractor's performance, and an annual resurvey and evaluation, a review was made of: the current Approved Supplier List, records of the last PSCo annual surveys and/or reviews of ASME Certificates and Supplier Evaluation Reports for ten suppliers of materials, welding, heat treating, plating, testing, nondestructive examination, calibration, and survey/audit of suppliers.

   Within this area of inspection, no nonconformances or unresolved items were identified.

4. Procurement Product Acceptance: The inspector reviewed Section 8, "Control of Materials Before Fabrication" of the QA Manual, to verify that written measures were available for the control of product acceptance activities.

   To verify that the QA program procedures were being properly implemented and that the results of product acceptance activities are documented and reviewed for acceptability by responsible personnel, a review was made of receiving inspection documents related to receipt of machined parts, consisting of a purchase order, drawing, supplier's Certificate of Compliance, Manufacturing Outline (traveler), Trouble and Failure Report and a Product Quality History Log Sheet. For raw material receipt inspection, a review was made of a purchase order, drawing, Manufacturing Outline (traveler), PSCo specification No. 12.11.1, M.R.C. Checklist for inspection, and the ANI Buyoff Log.

   Within this area of inspection, no nonconformances or unresolved items were identified.

ORGANIZATION: PACIFIC SCIENTIFIC COMPANY
KIN-TECH DIVISION
ANAHEIM, CALIFORNIA

REPORT NO.: 99900255/82-01	INSPECTION RESULTS:	PAGE 5 of 5

5. A 10 CFR Part 21 written report was made by Bergen-Paterson Pipesupport Corporation (B-P) on March 6, 1981. This report concerned insufficient design clearance between combinations of B-P special designed pipe clamps and Pacific Scientific Company (PSCo) designed mechanical shock arrestor forward brackets furnished by B-P for use on the Callaway Unit 1. A follow-up inspection was made at B-P and documented in Inspection Report No. 99900209/81-01. Since the findings concerned the PSCo designed brackets, a follow-up was also made at PSCo in Anaheim, California.

In summary, review of records at PSCo supported the findings at B-P. The mismatch appeared to have resulted from B-P's use for piping clamp design purposes of the PSCo sales catalog drawings for the brackets. These catalog drawings had not been revised to reflect the changes made in November 1976, in the PSCo engineering design drawings. It does not appear that B-P had contacted PSCo prior to using the catalog drawings for design purposes, as directed by the PSCo sales catalog front page "Notice."

After the initial notification of the deficiency by B-P to PSCo by means of a Discrepant Material Report L-221, and several telephone conversations during January 1981, between PSCo and B-P, and including furnishing of requested information to Bechtel Power Corporation by PSCo, the PSCo QA Manager indicated he had received no further contacts concerning the problem, and was not advised of what correction had been made at the Callaway site by B-P.

Further discussions established that PSCo had reviewed their sales orders for the affected Models PSA-3 and PSA-10 arrestors assemblies (furnished to B-P and numerous other customers), for the period of April 1977 through April 1981, and determined there were no other reports of mismatch interference. The problem was limited to the special design by B-P of pipe clamps for the Callaway, Unit 1 site. The B-P purchase order for the SNUPPS-Callaway Unit 1 was received by PSCo on September 21, 1979.

In conclusion, it was determined that the PSCo engineering design drawings governing the design of the Models PSA-3 and PSA-10 forward brackets were revised in November 1976, to provide a forged configuration, but PSCo failed to revise the sales catalog affected drawings until January 1981. These obsolete catalog drawings were used by B-P for design reference which resulted in the mismatch. Also, written measures to control the issuance, revision and use of the sales catalog drawings were not available at PSCo in Anaheim, California.

ORGANIZATION: QUADREX CORPORATION
CAMPBELL, CALIFORNIA

REPORT NO.: 99900512/82-01	INSPECTION DATE(S) 2/1-5/82	INSPECTION ON-SITE HOURS: 29

CORRESPONDENCE ADDRESS: Quadrex Corporation
ATTN: Dr. L. P. Bupp
Senior Vice President, Corporate Services
1700 Dell Avenue
Campbell, CA 95008

ORGANIZATIONAL CONTACT: J. Goldin, Manager, Corporate QA
TELEPHONE NUMBER: (405) 866-4510

PRINCIPAL PRODUCT: Engineering Consultants

NUCLEAR INDUSTRY ACTIVITY: The Quadrex Corporation has approximately 913 employees of which 27% are assigned to safety-related activities.

ASSIGNED INSPECTOR: C J Hale for 2-23-82
R. H. Brickley, Reactor Systems Section (RSS) Date

OTHER INSPECTOR(S):

APPROVED BY: C J Hale 2-23-82
C. J. Hale, Chief, RSS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: Initial management meeting and QA program assessment.

PLANT SITE APPLICABILITY:

Not Identified

ORGANIZATION: QUADREX CORPORATION
CAMPBELL, CALIFORNIA

REPORT NO.: 99900512/82-01	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to the requirements of Criterion V of 10 CFR Part 50, Appendix B and Section 9 (Corrective Action) of ANSI N45.2.11 neither the Quadrex Corporation QA Program nor its implementing procedures require that the design process and verification procedure be reviewed and modified as necessary when a significant design change is necessary because of incorrect design.

2. Contrary to the requirements of Criterion V of 10 CFR Part 50, Appendix B and Section 3.1 of Quality Assurance Procedure (QAP)-201 (Quality Assurance and Project Indoctrination), the records of attendance at QA indoctrination sessions did not provide evidence that two members of procurement and one member of engineering had received QA indoctrination.

3. Contrary to the requirements of Criterion V of 10 CFR Part 50, Appendix B and ANSI N45.2.12, annual audits of QA Engineering and computer program verification activities were not conducted during 1981.

4. Contrary to the requirements of Criterion V of 10 CFR Part 50, Appendix B and Section 4.1.5. of QAP-1003 (Audit Reporting, Followup and Closeout), the response to a Quality Audit Finding was not submitted by the required date, nor was an extension requested.

C. UNRESOLVED ITEMS:

The following QAPs that implement the Quadrex Corporation QA Program require revision in order to clarify the procedure with respect to QA program implementation:

1. QAP-309 (Verification and Control of Digital Computer Programs) - Section 4.4 needs clarification concerning errors detected in a computer program that may have an affect on analyses that have utilized the uncorrected version of the program.

2. QAP-902 (Reporting of Defects and Nonconformances - 10 CFR Part 21) - Section 4.4 does not require the documentation of the reason for disapproval by the Responsible Officer, nor that this documentation be returned to the original evaluators for reconsideration.

ORGANIZATION: QUADREX CORPORATION
CAMPBELL, CALIFORNIA

REPORT NO.: 99900512/82-01	INSPECTION RESULTS:	PAGE 3 of 3

3. QAP-906 (Stop Work Action) - Section 3.0 does not specify that the Manager, QA Engineering has the authority to issue stop work order, nor that the President and Senior Vice President, Corporate Services, has override authority on such stop work action.

D. OTHER FINDING OR COMMENTS:

1. Initial Management Meeting - A meeting was conducted with the management of Quadrex Corporation to acquaint them with the Licensee Contractor Vendor Inspection Program (LCVIP), the NRC organization relative to the Vendor Programs Branch, implementation of the LCVIP, and the types of documents generated and processed in implementing the program.

2. QA Program Assessment - The Quadrex Corporation QA Program Manual and its implementing procedures governing the areas of QA Program, organization, engineering control, procurement control, QA records, and audits were reviewed to determine that they were consistent with quality and technical commitments to codes, standards, regulations, and guides. The documentation of completed work in these areas consisting of the corporate organization chart, indoctrination training records for seven individuals, one management evaluation (QA Program), three analyses, two specifications, four drawings, two procurement files, two external audit files, five design verification reports, and qualification records of four audit team leaders were examined for program implementation. The four nonconformances documented in B above and the one unresolved item documented in C above were identified.

ORGANIZATION: ROCKWELL INTERNATIONAL
FLOW CONTROL DIVISION
RALEIGH, NORTH CAROLINA

REPORT NO.: 99900058/82-01	INSPECTION DATE(S) 2/8-11/82	INSPECTION ON-SITE HOURS: 60

CORRESPONDENCE ADDRESS: Rockwell International
Flow Control Division
ATTN: Mr. J. V. Grasso, General Plant Manager
1900 South Saunders Street
Raleigh, NC 27603

ORGANIZATIONAL CONTACT: Mr. R. A. Bandukwala
TELEPHONE NUMBER: (919) 832-0525

PRINCIPAL PRODUCT: ASME Section III Class 1, 2, and 3 valves.

NUCLEAR INDUSTRY ACTIVITY: Rockwell International - Flow Control Division's contribution to the nuclear industry represents approximately 10% of its total work load.

ASSIGNED INSPECTOR: Wm D. Kelley 3/16/82
W. D. Kelley, Reactive & Components Program Section (R&CPS) Date

OTHER INSPECTOR(S): I. Barnes, Chief, R&CPS

APPROVED BY: I. Barnes 3/18/82
I. Barnes, Chief, R&CPS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection and the inspection documented in Inspection Report No. 99900058/81-02 were made as a result of: (1) the issuance of a licensee event report by the Carolina Power and Light Company concerning a stem to stem disc separation in a main steam isolation valve installed at the Brunswick Steam Electric Station, Unit 2; and (2) the issuance of a licensee event
(continued on next page)

PLANT SITE APPLICABILITY:

Records identified with the following nuclear facilities were examined during this inspection: 50-324; 50-325; 50-366; and 50-557.

ORGANIZATION: ROCKWELL INTERNATIONAL
FLOW CONTROL DIVISION
RALEIGH, NORTH CAROLINA

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SCOPE (cont.) report by the Georgia Power Company concerning a stem to stem disc separation in a main steam stop valve installed at the E. I. Hatch Nuclear Plant, Unit 2. The areas included in this inspection were the manufacturing process control provisions utilized in the manufacture of main steam isolation valves, with specific emphasis placed on controls for assembly, pin insertion and plug welding.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 9, Revision 8, of the QA Manual, review of the Valve Route Card for a completed and shipped 26" 1612 (WCC) JMMNTY main steam isolation valve (Black Fox Nuclear Project 2, Serial No. PI-38) showed the following examples of the failure of applicable personnel to sign and/or date operations to denote completion:

   a. Sequence No. 070 was not signed by either manufacturing or Quality Assurance personnel.

   b. Sequence Nos. 050, 060, 090, 100, 110, 120, 130, and 260 were not signed by supervisory personnel to denote verification of operation completion. Personnel performing the operations were identified on the Route Card, but dates of completion had not been entered.

   c. Sequence No. 160 was not signed by a Rockwell Inspector and Sequence Nos. 170, 260, 280, 290, and 311 had been signed but not dated by a Rockwell Inspector.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 6, Revision 7, of the QA Manual, the Valve Route Card applicable to the ASME Section III Code Class 1 valve identified in B.1 above did not indicate the correct Method Specification number to be used for assembly of the stem to stem disc and assembly of the main disc to piston assembly; i.e. Method Specification 7736LR was listed on the Route Card to be used for the assembly operations, whereas Method Specification 7718, Revision 0 was the applicable issued specification.

ORGANIZATION: ROCKWELL INTERNATIONAL
FLOW CONTROL DIVISION
RALEIGH, NORTH CAROLINA

REPORT NO.: 99900058/82-01	INSPECTION RESULTS:	PAGE 3 of 5

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph NB-4432 in Section III of the ASME Code (1971 Edition), locking pins were welded to stem discs and main discs (pressure parts) in main steam isolation valves which had been furnished to E. I. Hatch, Unit 2, without specification or evidence of use of welding procedures that had been qualified in accordance with Section IX of the ASME Code.

C. UNRESOLVED ITEMS

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Open) Notice of Nonconformance, Inspection Report No. 81-02: Furnishing of spare stems and discs to the Brunswick Steam Electric Station with oversized disc female threads and undersized stem male threads in regard to Class 3 requirements.

   The status of this nonconformance was not reviewed during this inspection, as a result of correspondence not having been completed on this item.

2. (Open) Unresolved Item, Paragraph C, Inspection Report No. 81-02: Applicability of Appendix B to 10 CFR Part 50 to the procurement of spare stems and discs by Carolina Power and Light Company (CP&L).

   The NRC inspectors were informed, that a copy of an exception to the CP&L Purchase Order No. 716707 specification of Appendix B to 10 CFR Part 50 as being applicable for the supply of spare stems and discs, had not been located. Resolution of this item has been deferred pending completion of the response to the nonconformance identified in 1. above.

E. OTHER FINDINGS OR COMMENTS:

1. Assembly of Main Steam Isolation Valves Furnished to Brunswick, Units 1 and 2, and E. I. Hatch, Unit 2

   a. The NRC inspectors were unable to review the assembly history of these valves, as a result of being informed by Rockwell personnel that Route Cards were only used for piece manufacture in the time frame these valves were produced.

b. Examination of Special Engineering Instructions 408 which contained the Rockwell requirements for manufacture of the E. I. Hatch, Unit 2, valves, revealed no specific criteria for valve assembly. One nonconformance was identified (see paragraph B.3) in regard to the failure to specify the use of a qualified welding procedure for welding of locking pins to the stem disc and main disc.

2. Current Assembly Practices Used for Main Steam Isolation Valves

a. A review was made of the Valve Route Card for a 26" 1612 (WCC) JMMNTY main steam isolation valve, Serial No. PI-38, which had been furnished to Black Fox Nuclear Project 2 during 1981. This review was made in order to determine the current assembly process control provisions for this design of valve, and to ascertain compliance with specified requirements during manufacture.

This inspection showed a difference existed in assembly method from that utilized for the Brunswick and E. I. Hatch valves; i.e., locking pins were retained by mechanical staking and not by plug welding. The NRC inspector was informed that this method had been utilized for valves shipped since early 1979. During this review, one nonconformance (see paragraph B.2) was identified pertaining to the identity of the Method Specification utilized for staking of locking pins. Method Specification 7736LR was listed on the Valve Route Card as the applicable specification to be used for stem to stem disc to piston assembly. Sequence Nos. 080 and 110 were signed off by a Rockwell Inspector indicating acceptance of these assembly operations in accordance with Method Specification 7736LR. On request to see this Method Specification, the NRC Inspector was informed that this specification had been replaced at customer request by inserting the content in Method Specification 7718, Revision 0. No information was provided in regard to the failure to revise the Route Sheet, or the basis for sign off by the Rockwell Inspector.

An additional nonconformance (see paragraph B.1) was identified in regard to the failure to comply with the QA program manufacturing process control requirements in existence at the time of manufacture of this valve. Review of the current QA program requirements for manufacturing process control (Section 9,

Revision 9 - September 3, 1981) showed a change had been made in sign off requirements. The present revision now requires Quality Assurance personnel to sign off only inspection operations listed on the Route Card and not all operations.

Review of Standard Operating Instruction (SOI) 40-19-05, dated December 3, 1981, which pertains to documentation gathering and processing for nuclear valves, indicates it is a Quality Assurance responsibility to review Route Cards for completeness and correctness (after performance of indicated operations) prior to moving material to stores. No operation was listed, however, on Piece Route Cards which clearly required the Rockwell Inspector to perform this function; i.e., the final inspection operation prior to moving material to stores required the Rockwell Inspector to only visually and dimensionally inspect the part. An operation requiring review for completeness was entered on the Valve Route Card which is used for assembly.

b. An inspection was performed with respect to the calibration status of five micrometers, one dial bore gage, and all current torque wrenches used in valve assembly. No nonconformances were identified in this area of inspection. It was established, however, that the present calibration program did not include a torque multiplier used with torque wrenches in valve assembly. The NRC inspector was informed that this device would be included in the calibration program to assure necessary accuracy. A follow-up will be made on this subject at a future inspection.

The NRC inspector additionally noted that the reasons for return of devices for repair were not always entered in the calibration records. As a result, positive verification that a repair was not related to device accuracy could not be accomplished.

3. Manufacturing Process Control-Present Work

An inspection was performed in regard to the compliance of eight parts in manufacture during the inspection, with respect to QA program process control and customer specification requirements. No nonconformances were identified in this area of inspection.

ORGANIZATION: ROCKWELL INTERNATIONAL, INC.
ENERGY SYSTEMS GROUP
CANOGA PARK, CALIFORNIA

REPORT NO.: 99900266/82-01	INSPECTION DATE(S): 1/11-15/82	INSPECTION ON-SITE HOURS: 28

CORRESPONDENCE ADDRESS: Rockwell International, Inc.
Energy Systems Group
ATTN: Mr. D. Empey, Quality Assurance Director
8900 De Soto Avenue
Canoga Park, CA 91304

ORGANIZATIONAL CONTACT: Mr. D. Empey, Quality Assurance Director
TELEPHONE NUMBER: (213) 700-3926

PRINCIPAL PRODUCT: Class 1, 2, and 3 vessels, piping and components.

NUCLEAR INDUSTRY ACTIVITY: Commercial Nuclear Production of Rockwell International, Inc., Energy Systems Group, Canoga Park, CA, totals 25% of total company production. Twenty-six nuclear contracts are presently in-house for current and future production.

ASSIGNED INSPECTOR: J.W. Sutton 3-16-82
J. W. Sutton, Reactive & Components Program Section (R&CPS) Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes 3-16-82
I. Barnes, Chief, R&CPS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: Weld control, nonconformance/corrective action, 10 CFR Part 21 Inspection, follow up on identified heater leadwire insulation deficiency in Presurized Water Reactor post LOCA Hydrogen Recombiners, and review of vendor activities.

PLANT SITE APPLICABILITY:

Applicable Docket Nos. (Pressurized Water Reactor Post LOCA Hydrogen Recombiners): 50-338, 339, 404; 50-528, 529, 530, 592, 593; 50-518, 519, 520, 521; 50-553, 554; 50-461, 462; 50-454, 455; 50-456, 457; 50-334, 412; 50-245, 336, 423; 50-289, 320.

ORGANIZATION: ROCKWELL INTERNATIONAL, INC.
ENERGY SYSTEMS GROUP
CANOGA PARK, CALIFORNIA

REPORT NO.: 99900266/82-01	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS:

1. Weld Control - The inspector reviewed Energy Systems Group's (ESG) QA Manual, Section N 6.01-N 6.04 and ESG's ASME Code Manual, Sections 8.3 and 9.3, three weld qualification procedures, five welder qualification records, weld material issuance records, two shop work order travelers, current qualified welders record and observed welding operations in-process.

   As a result of the review of welding documentation and observation of available work in progress, the inspector determined that control of welding during the manufacturing process complied with the stated commitments in ESG's QA Programs.

2. Nonconformance/Corrective Action - The inspector reviewed ESG's QA Manual Sections 10 and 14 and ESG's ASME Code Manual Sections 15 and 16, 3 closed and 7 open corrective action reports, 21 discrepancy reports and associated documentation to determine compliance to QA/QC documentation requirements. The corrective action taken to prevent recurrence was examined for implementation. Segregation areas, designated for storage of nonconforming items, were inspected. Relative to the documents examined, the inspector determined that activities relating to the control and disposition of nonconforming items complied with ESG's QA/QC program requirements.

3. 10 CFR Part 21 Inspection - The inspector reviewed ESG's written policy for evaluation and reporting of identified component defects with respect to 10 CFR Part 21 requirements. A review of posting was made and was found to be in compliance with 10 CFR Part 21 requirements. The inspector also reviewed the instructions and procedures to be used to implement the requirements, including evaluation, conclusions and corrective action for 16 possible Part 21 occurrences documented by ESG since 1977.

ORGANIZATION: ROCKWELL INTERNATIONAL, INC.
ENERGY SYSTEMS GROUP
CANOGA PARK, CALIFORNIA

REPORT NO.: 99900266/82-01	INSPECTION RESULTS:	PAGE 3 of 3

As a result of the inspector's review of available documentation, it was determined that the requirements of 10 CFR Part 21 have been complied with in those areas, that required ESG's notification to buyers for further information or to provide corrective action requirements.

4. Follow up on Hydrogen Recombiner Heater Leadwire Insulation Deficiency -

   a. Rockwell International, Inc., Energy Systems Group (ESG) filed an information report with the Nuclear Regulatory Commission, as a result of testing which indicated that heater leadwire routing areas of Pressurized Water Reactor Post LOCA Hydrogen Recombiners may reach temperatures higher than the leadwire insulation design rating. This condition has been evaluated to result in a minimum service life of 10 years, based on bimonthly operational checks plus 60 days continuous operation in the event of a LOCA.

   b. ESG Engineering proposed a design change for the affected units to lower the temperature that would be encountered. This would be accomplished by the addition of spacers between the cover plate and flange of the heater. Also, rewiring of those units with 302°F insulation would be required.

   c. ESG has determined that eight commercial nuclear contracts had units that would be subject to the proposed design changes. The units involved would have to be modified before the end of a 10 year operational period. ESG has issued letters of proposed corrective action to all affected customers, indicating the steps to be taken to correct this design deficiency.

   d. The inspector determined after review of all available documentation and discussion with management and engineering personnel, that adequate corrective action and preventive measures have been taken by ESG in regard to the reported deficiency.

ORGANIZATION: SARGENT & LUNDY ENGINEERS
CHICAGO, ILLINOIS

REPORT NO.: 99900507/81-04	INSPECTION DATE(S): 12/14-17/81	INSPECTION ON-SITE HOURS: 28

CORRESPONDENCE ADDRESS: Sargent & Lundy Engineers
ATTN: Mr. R. W. Patterson, Senior Partner
55 East Monroe Street
Chicago, Illinois 60603

ORGANIZATION CONTACT: Mr. J. E. McFarland, Head, Quality Assurance Division
TELEPHONE: (312) 269-6370

PRINCIPAL PRODUCT: Architect Engineering Services

NUCLEAR INDUSTRY ACTIVITY: Sargent & Lundy (S&L) has major design responsibility on the following projects: Zimmer 1, Byron 1 & 2, Braidwood 1 & 2, La Salle 1 & 2, Clinton 1, and Marble Hill 1 and 2. S&L also has minor design responsibility on Fermi 2 and 12 modification, repair or service contracts for various utility clients.

ASSIGNED INSPECTOR: C J Hale /for 2-1-82
D. D. Chamberlain, Reactor Systems Section (RSS) Date

OTHER INSPECTOR(S):

APPROVED BY: C J Hale 2-1-82
C. J. Hale, Chief, RSS Date

INSPECTION BASES AND SCOPE:

A. BASES: Sargent and Lundy Topical Report No. SL-TR-1A and 10 CFR Part 50, Appendix B.

B. SCOPE: Status of previous inspection findings. Special inspection resulting from an NRC Region III request concerning potential generic design problems regarding the La Salle and Zimmer projects.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Nonconformance (81-02): The Design Criteria Status Report did not show the latest revision or issue date of a design criteria document. See Note 1 below for close out information.

2. (Closed) Nonconformance (81-01): Some design criteria documents do not include the applicable issue of codes, standards or regulatory guides. See Note 1 below for close out information.

3. (Closed) Nonconformance (81-01): An electrical Class 1E component was misclassified in the Clinton Power Station Classification Criteria Document. See Note 1 below for close out information.

   Note 1: The corrective action and preventive measures for the three nonconformances listed above were accomplished as part of an expanded effort which included correcting the specific items identified, conducting surveys of all projects and all controlled status reports and conducting internal audits to determine the adequacy of the surveys. The S&L internal audits resulted in 16 nonconformances issued to various projects. The number of findings in this area resulted in changes to some of the S&L review processes and standards. The changes will be accomplished and verified as a part of the close out of the S&L internal audit findings

4. (Closed) Nonconformance (81-02): The S&L internal audit system is deficient in a number of areas resulting in a reduction of comprehensiveness and effectiveness.

   Sargent & Lundy (S&L) actions to this nonconformance have resulted in a general strengthening of the S&L internal audit program and of the generic review of problems identified. The specific programmatic changes that have been made are:

a. Quality Assurance Procedure GQ-18.01 was revised to provide control and guidance in determining the need for supplemental project or generic audits.

b. New procedures were issued to require the review of nonconformances for their effect on other projects or possible trends, to provide guidance to auditors relative to sample sizing and to require project QA coordinators to review audit findings for possible effects or trends relative to their projects.

The implementation of the new and revised procedures is now in process and will be evaluated as a part of the routine programmatic NRC inspections.

E. OTHER FINDINGS OR COMMETNS:

Potential Generic Design Problems at La Salle and Zimmer - The NRC Region III request that initiated this area of inspection was a three part request and the results of the inspection for each part are as follows:

1. Document Control Problems Observed at General Electric (GE) - During a Region III inspection at GE on September 21-23, 1981; an observation was made that GE Design Report 22A7431 (Main Steam Piping and Equipment Loads) Revision 0, dated March 5, 1981, for the La Salle project made reference to GE document revisions which were different from the revisions that were listed in the GE Engineering Information System (EIS).

   This item was evaluated at S&L to determine the effect on S&L design if an incorrect revision for a reference document was listed in the La Salle GE Design Report. S&L uses load values from the design report and uses specific hanger drawings to develop support steel and/or support attachment design. S&L maintains a Vendor Document Status Report which lists the latest revision and status of GE supplied documents. Therefore, the incorrect listing of revisions for reference documents in the GE design report would not affect S&L developed design. This item will be evaluated further at GE to determine the existence or extent of document control problems at GE.

2. S&L Design Problem Observed at Quadrex - Region III conducted an inspection at Quadrex on September 22, 1981, relative to a La Salle allegation, concerning hanger drawing RI24-1504V, originally designed by S&L and subsequently changed by Quadrex, which called for tack welding at contacts between the pipe stanchion and variable spring support. This application of tack welding is not permitted in S&L Specification PI-LS-16, Appendix J, Revision 3, dated March 13, 1981.

   The following findings/conclusions were made from the results of this area of inspection at S&L:

   a. Quadrex is a company that has a contract with S&L to perform pipe stress analysis and hanger design for the La Salle project on specified subsystems.

   b. The original M09-RI24-1504V hanger drawing which specified tack welding was issued by S&L as revision A on September 20, 1978.

   c. S&L issued an engineering change notice (FM-658LS) on February 13, 1980, which removed the tack weld and called for a fillet weld.

   d. Quadrex subsequently obtained responsibility for the hanger subsystem and incorporated the engineering change notice (FM-658LS) in revision B of drawing M09-RI24-1504V on March 30, 1981.

   e. The design error was made by S&L in 1978 and the S&L hanger design program has gone through many changes since 1978.

   f. S&L present practice for hanger design is to verify the adequacy of all welds either by reference to the specific standard used or by performing a calculation for the weld size selected. The documentation verifying the adequacy of the welds is maintained.

   g. The present S&L practice of verifying the adequacy of all welds should preclude the improper use of tack welds.

3. Questionable S&L Design Practice Observed at the Zimmer Site - During a Region III site inspection in August 1978, certain hanger, snubber, pipe whip restraint, and attached structures were observed and certain design practices were questioned.

   The review of the items questioned and the present design process at S&L resulted in the following findings:

a. The S&L hanger design program has been revised numerous times since the RII inspection in 1978.

b. All of the design areas questioned, except for one have either been changed or the design has been verified as adequate by S&L.

c. The one design area that may require additional follow-up relates to beam stiffeners. The Region III inspector noted that beam stiffeners were being installed that were welded on three sides without openings at the corners. He stated that this is not considered an acceptable industry practice because the triaxial stresses, imposed due to welding, could result in cracking at the weldment.

S&L drawing S-529, Reactor Building Floor Framing Sections & Details, shows typical stiffener installations welded on three sides with openings in the two corners. However, the S&L position on this subject is that although it is normal practice to cut the corners of beam stiffeners for proper fit and then to weld three sides with corner openings; there is nothing that prevents the constructor from welding the corner gaps. As far as S&L is concerned, based on experience and research of the subject, this would create no problem. S&L is not aware of any history of problems in this area. The S&L position on this subject will be reported to Region III and further follow-up action will be taken if requested.

ORGANIZATION: SIEMENS-ALLIS, INC., SWITCHGEAR DIVISION
RALEIGH, NORTH CAROLINA

REPORT NO.: 99900773/82-01	INSPECTION DATE(S) 2/11-12/82	INSPECTION ON-SITE HOURS: 8

CORRESPONDENCE ADDRESS: Siemens-Allis, Inc.
Switchgear Division
ATTN: Mr. H. A. Hincks, General Manager
P. O. Box 29503
Raleigh, NC 27626

ORGANIZATIONAL CONTACT: Mr. Leonard C. Majkowski, Manager Quality Assurance
TELEPHONE NUMBER: (919) 365-6660 ex. 314

PRINCIPAL PRODUCT: Electrical Switchgear

NUCLEAR INDUSTRY ACTIVITY: Siemens-Allis, Inc., Switchgear Division (SA1-SD) supplies electrical switchgear for electrical generating and industrial plants. SA1-SD nuclear involvement represents less than one half of one percent of their total production.

ASSIGNED INSPECTOR: Wm. D. Kelley 3/18/82
Wm. D. Kelley, Reactive & Components Program Section (R&CPS) Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes 3/18/82
I. Barnes, Chief, R&CPS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made as a result of the identification by the Carolina Power and Light Company, that the dimensions of 6.9 KV switchgear supports and anchor bolts furnished to Shearon Harris, Unit 1, for installation in the auxiliary building, may not meet final seismic requirements.

PLANT SITE APPLICABILITY: Docket No. 50-400

ORGANIZATION: SIEMENS-ALLIS, INC., SWITCHGEAR DIVISION
RALEIGH, NORTH CAROLINA

REPORT NO.: 99900773/82-01	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None.

B. NONCONFORMANCES:

None.

C. UNRESOLVED ITEMS:

None.

D. OTHER FINDINGS OR COMMENTS:

Construction Deficiency Report by Carolina Power and Light Company (CP&L): Problem reported was undersized embedment depth of the sill channels and undersized bolt hole dimensions in the rear sill channel supplied for non-Class 1E seismically-designed 6.9 KV switchgear.

The non-Class 1E 6.9 KV and 4.16 KV switchgear were purchased by Ebasco Service Incorporated (ESI) on their purchase order NY-435113 in accordance with their specification 255-72. The specification states that the equipment is not classified as Class 1E; however, it must be seismically qualified to demonstrate that the equipment and its supports are designed to maintain structural integrity during and after a Design Basis Earthquake. The specification states in a note that the Reactor Coolant Pump breakers, Bus PT Cubicles and associated equipment require full Class 1E qualification; thus, safety-related equipment was installed in the nonsafety related 6.9 KV switchgear cabinet that was to be installed in the CP&L Shearon Harris Nuclear Power Plant, Unit 1, Reactor Auxiliary Building.

ESI requested in their letter of December 14, 1978, that SAI-SD (West Allis, Wisconsin) make arrangements for shipping the sill channels and confirm the shipping date by January 5, 1979. SAI-SD evaluated their standard sill channels as being adequate and shipped them to the Shearon Harris Nuclear Power Plant on April 16, 1979; however, the shipment of the switchgear did not commence until April 25, 1980. During this period Qualification Report No. 90365-1 for Class 1E 6.9 KV switchgear per IEEE 323/1974, dated July 21, 1980, was submitted to ESI. The report states in Section III "Stress Analyses" that the switchgear sill channels were to be

ORGANIZATION: SIEMENS-ALLIS, INC., SWITCHGEAR DIVISION
RALEIGH, NORTH CAROLINA

REPORT NO. 99900773/82-01	INSPECTION RESULTS:	PAGE 3 of 3

4-inch X 2½-inch 13.8 pounds per foot channel; however, the report assumes 5/8-inch diameter bolts and gives the loads to which they will be subjected. ESI required in their letter of September 16, 1980, that a factor of 1.5 be applied to design basis earthquake. On September 25, 1980, SAI-SD (Raleigh, NC) sent a telegram to their New York sales office requesting them to notify ESI that each anchor bolt for the rear sill channel must have the capacity for 10,480 pounds in tension and 18,816 pounds in shear. ESI advised SAI-SD that the anchor bolts for the rear sill channel would be 1-inch in diameter and the replacement sill channel for the non-Class 1E switchgear was shipped from SAI-SD (West Allis Wisconsin) on December 19, 1980.

ORGANIZATION: SQUARE D COMPANY
POWER EQUIPMENT DIVISION
PERU, INDIANA

REPORT NO.: 99900367/81-01	**INSPECTION DATE(S):** 11/30-12/4/81	**INSPECTION ON-SITE HOURS:** 28

CORRESPONDENCE ADDRESS: Square D Company
Power Equipment Division
ATTN: Mr. R. H. Brunner
Plant Manager
252 North Tippecanoe
Peru, IN 46970

ORGANIZATION CONTACT: Mr. L. D. West, Manager, Quality Assurance
TELEPHONE: (317) 472-3381

PRINCIPAL PRODUCT: Motor Control Centers

NUCLEAR INDUSTRY ACTIVITY: Less than one percent of total effort with current contracts scheduled for completion in January 1983.

ASSIGNED INSPECTOR: W. E. Foster — 1/19/82
W. E. Foster, Reactive Inspection Section (RIS) — Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes — 1/19/82
I. Barnes, Chief, RIS — Date

INSPECTION BASES AND SCOPE:

A. BASES: Appendix B of 10 CFR Part 50 and 10 CFR Part 21.

B. SCOPE: This inspection was made as a result of written notification of the following problems: (1) improperly crimped terminal lugs, improperly tightened screws on devices and terminal blocks, and excessively bent terminal lugs on 480 Volt motor control centers that have been furnished to the Shoreham Nuclear Power Station, Unit No. 1; (2) lubricant on rubber bumpers of NEMA Size 3 starters in 480 volt motor control centers that have been furnished to the Shoreham Nuclear Power Station, Unit No. 1; and (3) pinched wires in 480 volt motor control centers that have been furnished to the V. C. Summer Nuclear Power Station, Unit No. 1. Additionally, the following areas were inspected: (1) implementation of 10 CFR Part 21; (2) follow up on previously identified nonconformances; (3) follow up on previously identified unresolved items; and (4) change control.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Quality Control Procedure (QCP) No. 187, dated February 18, 1980, the reportability to the NRC portion of a QCP-187 form had not been completed in regard to a problem concerning coatings on rubber bumpers of Size 3 starters.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 3.5 of the Corporate QA Manual, dated May 16, 1978, design control measures commensurate with those of the original design had not been performed for the field change which relocated units within the cabinets in order to eliminate the problem of pinched wires. This was evidenced by the lack of documentation which would address the effect that unit relocation would have upon the seismic qualification of the motor control centers.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and paragraphs III.C and IV of Standard Practice Bulletin No. 512.406, dated December 6, 1976, corrective action for each finding had not been reviewed within 60 calendar days of the audit date of a QA Program Audit conducted July 13-14, 1978. The QA Audit Findings Reports (9) for the audit, reflect dates of August 20, 21, 28, 1979, for satisfactory implementation of corrective action (Corrective Action Implementation Audit).

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Standard Practice Bulletin No. 512.307, dated November 10, 1977, Routing Change Form No. PE-1014 is not being used to effect changes to Master Record Routings. Note: The inspector was provided a document entitled, "Operational Routing Manual" dated September 28, 1981, and informed that this manual is used to change Master Record Routings. The inspector noted that the manual had not been approved and was informed that it is in the formative stage.

5. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraph II.C of Standard Practice Bulletin No. 500.020, dated September 20, 1976, and paragraph 3 of Quality Control Procedure No. 200-9, Revision C, dated October 15, 1981: (a) personnel had not satisfactorily performed the electrocoat paint process to comply with Special Process Procedure No. B-1, dated October 12, 1977; and (B) records maintained on the electrocoat paint process did not verify control of equipment settings, chemical tests and gauge readings. This was evidenced by the following examples:

Requirements	Observed-12/2/81 (late morning)
Sta. No. 2, 140-180°F	128°F
" " 4, 155-165°F	146°F
" " 7, 13-15 PSI	20 PSI
" " 13, 325-350°F	380°F
" " 9, pH 8.2 - 9.0	(see note below)
" " 2, Free Alkali 8.5-16.5 pts.	(see note below)

Special Process Control Records, dated November 2-December 2, 1981, indicated that: (a) Station No. 2 varied from 132 to 158°F; (b) Station No. 4 varied from 138 to 156°F; (c) Station No. 7 varied from 20-30 PSI; it was also noted that the record reflects a requirement of 15-20 PSI as opposed to the procedure; (d) Station No. 13 indicated 380°F; (e) Station No. 9 varied from 8.7 to 9.5 with 25 of 39 readings outside the requirements; and (f) Station No. 2 varied from 10.7 to 22.6, with 30 of 32 readings outside the requirements.

6. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraphs II.E.1 and .4 of Standard Practice Bulletin No. 500.012, dated June 22, 1973: (a) an entry of the date, holder and revision design notice number had not been made on the drawing location card (or a Reproduction Services Request Form) for Drawing No. D-80103-005, which had been removed from the master files; and (b) previous revision marks had not been removed from point, part, or line of: (1) Bills of Material, Nos. 30318-286-57, Revision A1, dated July 30, 1979; 30322-407-58, Revision R, dated August 21, 1980; and (2) Specification No. A-40004-013-01, Revision B, dated October 4, 1976.

7. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph II.B.1 of Standard Practice Bulletin No. 512.407, dated May 11, 1976, the Peru Plant QC Supervisor had not reviewed each written Quality Control Procedure annually, as evidenced by the lack of Records of Quality Control Procedure Review.

C. UNRESOLVED ITEMS:

Paragraph 2.1.5 of Quality Control Procedure No. 200-3, Revision B, dated August 31, 1981, requires that Utility Sales route all nuclear safety-related purchase and change orders through Design Engineering and Quality Assurance for review and approval.

The NRC inspector verified that Design Engineering and Quality Assurance receives copies of purchase and change orders from Utility Sales; however, it could not be determined that these documents are reviewed and approved by Design Engineering and Quality Assurance. The inability to make this determination results from the apparent lack of requirements to document such review and approval.

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Deviation (79-01): The receiving inspector had not signed and dated the Delivery-Final Receipt copies of purchase orders for accepted material.

   The NRC inspector reviewed the Delivery-Final Receipt file of purchase orders dated October 1-15, 1981, and verified that they had been signed and dated.

2. (Closed) Deviation (79-01): Straight vertical lines had not been used to indicate changes to Standard Practice Bulletin (SPB) Nos. 100.013 and 512.404.

   The NRC inspector verified that the SPB controlling such documents had been revised and was being implemented.

3. (Closed) Deviation (79-01): Rework dispositions had not been completed within the required 10 working days.

   The NRC inspector verified that the SPB had been revised to require a 10 day follow-up. It was being implemented.

4. (Closed) Deviation (79-01): Customer inspection hold points had not been documented in Square D records.

   The NRC inspector verified records are initiated to reflect customer inspection hold points.

5. (Resolved) Unresolved Item (79-01): Master Record Routings were being changed with forms other than what the Standard Practice Bulletin specified.

   The inspector determined that the Standard Practice Bulletin was not being implemented, despite its validity. Consequently, a nonconformance was identified.

6. (Resolved) Unresolved Item (79-01): The NRC inspector was unable to determine that instrumentation used in the cleaning and painting process was accurately indicating the medium being measured.

   Observations and record review indicated that several controlling factors were outside the requirements of the special process procedure. Consequently, a nonconformance was identified.

E. OTHER FINDINGS OR COMMENTS:

1. Follow up on Regional Request - Correction of defective cable terminations is being accomplished by site personnel. The NRC inspector was informed that the crimping problem was restricted to Thomas and Betts (T&B) terminals and tools, and isolated to the Shoreham Nuclear

Power Station, Unit No. 1. Also, the NRC inspector was informed that T&B terminals and tools are no longer used on nuclear orders; however, no nuclear orders were in process, so this statement could not be verified. While Long Island Lighting Company's report to the Nuclear Regulatory Commission also addressed problems with (a) improperly tightened terminal block screws, (b) terminal lugs bent more than permitted by the manufacturer of the lugs, and (c) conductors improperly inserted into the lugs; these were not addressed in documented complaints to Square D. Square D had been provided with numerous inspection reports of activity at the site and some of the problems were reflected.

2. Follow up on 10 CFR Part 21 Report - The purchasers of 480 volt motor control centers (MCCs) that used Size 3 starters/contactors had been informed of the possibility of lubricant on the rubber bumpers of the starters/contactors. Two of the three had responded. The MCCs at the Shoreham Nuclear Power Station, Unit No. 1, and the San Onofre Nuclear Power Station, Unit Nos. 2 and 3, had been inspected for lubricant on the bumpers and none had been found; however, the bumpers were replaced on safety-related MCCs. The starters/contactors are fabricated at the Raleigh, NC plant, therefore, evaluation of preventive measures could not be accomplished at the Peru, IN plant. The NRC reportability portion of Form QCP-187 had not been completed as required. The attendant Quality Control Procedure is nothing more than a copy of the form.

3. Pinched Wires in 480V MCC - The problem of pinched wires in 480 volt motor control centers (MCCs) was corrected at the V. C. Summer Nuclear Power Plant, Unit No. 1, by relocating units within the cabinets. The field change of relocating units within the cabinets had not been subjected to the design control measures employed in the original design. This was particularly evident by the lack of documentation that would address the effect that unit relocation would have upon the seismic qualification of the MCCs.

   The manufacturer, prior to this inspection, had initiated a record search which was completed during this inspection, to identify other purchasers of MCCs with the suspect configuration. They will be notified and necessary actions taken.

   To preclude recurrence, drawings have been revised, the interferring tie channel has been redesigned, and is being used. MCCs using the redesigned tie channel have not been supplied to nuclear power plants nor has this configuration been subjected to qualification tests.

ORGANIZATION: STEWART AND STEVENSON SERVICES, INC., ENGINE DIVISION
HOUSTON, TEXAS

REPORT NO.: 99900760/81-01	INSPECTION DATE(S): 10/26-30/81	INSPECTION ON-SITE HOURS: 53

CORRESPONDENCE ADDRESS: Stewart and Stevenson Services, Inc.
Engine Division
ATTN: Mr. C. L. Ward
Executive Vice President and
General Manager
Post Office Box 1637
Houston, Texas 77001

ORGANIZATION CONTACT: Mr. Rich Stevens
TELEPHONE: (713) 671-6100

PRINCIPAL PRODUCT: Diesel Generator Sets

NUCLEAR INDUSTRY ACTIVITY: Present: 4 units total in-work
2 diesel generator sets 3875kW, 4.16kV
2 diesel auxiliary feedwater pump drives

ASSIGNED INSPECTOR: L B Parker — 1-14-82
L. B. Parker, Reactive Inspection Section (RIS) — Date

OTHER INSPECTOR(S): I. Barnes, RIS

APPROVED BY: I. Barnes — 1-14-82
I. Barnes, Chief, RIS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and 10 CFR Part 21.

B. SCOPE: This inspection was made in response to: (1) a request by Region III of the Nuclear Regulatory Commission to evaluate 10 CFR Part 21 compliance, resulting from the identification that the Commonwealth Edison Company, La Salle County Station, was not receiving maintenance publications for its diesel generators; and (2) the receipt of a Bechtel Power Corporation 10 CFR Part 21 report pertaining to a diesel generator camshaft bracket failure at the Southern California Edison, San Onofre Units 2 and 3.

A. VIOLATIONS:

1. Contrary to paragraph 21.6 in 10 CFR Part 21, a copy of Section 206 of the Energy Reorganization Act of 1974 was not posted.

2. Contrary to paragraph 21.21 in 10 CFR Part 21, procedures had not been adopted to implement 10 CFR Part 21.

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraphs 3.5, 3.5.1, and 3.5.2 of Product Specification 008 (basic) issued December 20, 1976, red reject tags 0248, 0967 and 2695 had not been removed from an electrical control panel (Work Order N75744) in the test berth. The corresponding NCR's 920, 922, and 793 had been corrected and closed on May 5, 1981.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Definition 1 of Engineering Specification ED007 (basic) issued December 15, 1976, Installation Drawing 62240-1, Revision H, "Commonwealth Edison Auxiliary Feedwater Pump Drive 16V-149T1" does not show an air intake support and a support for the service water booster pump. Also not shown are gussets which were added to eliminate the anomaly found during seismic testing of a similar unit (Work Order 74505).

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraphs 3.3, 3.4, and 4.0 of Production Specification 005 (basic) issued December 27, 1976, no documentary evidence was available to indicate that welding machines had been certified.

4. Contrary to Criterion XIV of Appendix B to 10 CFR Part 50, the established measures did not provide for identification of inspection and test status, as evidenced by the inspection signoffs on Inspection Point Program No. 108 for Work Order No. N79905/6 (Marble Hill Auxiliary Feedwater Pump Drive, Fan Assembly Support) indicating assembly machining and postweld heat treatment operation being performed prior to the assembly being fabricated.

5. Contrary to Criterion IX of Appendix B to 10 CFR Part 50 and Quality Control Specification QCS 001, Revision B, measures were not established to assure that heat treating was controlled in accordance with specification requirements as evidenced by: (a) placement of a heat treatment vendor, Houston Heat Treating Company, on the Qualified Vendor List without evidence of capability to comply with heat treatment specification requirements; and (b) use of the vendor for postweld heat treatment of Marble Hill auxiliary feedwater pump diesel engine drive subassemblies without verification of temperature uniformity of the furnace that was used for the heat treatment cycles.

6. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Quality Control Specification QCS 017, Revision F, review of the Qualified Vendor List showed no basis for inclusion of 411 Category B vendors from a total of 555 such vendors.

7. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph T-661 in Section V of the ASME Code, Article 6, Liquid Penetrant Examination Procedures QCS 003, Revision G, had not been qualified at the minimum examination temperature of 50°F permitted by the procedure.

8. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Quality Control Specification QCS 003, Revision G, Clinton, Unit 1 emergency diesel generator set cooling system piping welds had been signed off on May 23, 1980, as being acceptable in the applicable inspection point program but had not been recorded on a Quality Control Liquid Penetrant Inspection Report as of the date of this inspection.

9. Contrary to Criterion IX of Appendix B to 10 CFR Part 50 and paragraph ND-5521(a) in Section III of the ASME Code, a Level III examiner was appointed on December 4, 1978, by Stewart and Stevenson and not certified by the required examination for technical competence.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

None

E. OTHER FINDINGS OR COMMENTS:

1. Regional Requests

a. A 10 CFR Part 21 report by Bechtel Power Corporation reported that Stewart and Stevenson (S&S) had been advised that a diesel generator camshaft bracket failure was a substantial safety hazard defect. S&S requested Electro-Motive Division General Motors Corporation (EMD) to evaluate the failure. EMD made a failure analysis and concluded that "this is an isolated failure in that it is due to human error rather than a design or mechanical problem." S&S made no other evaluation of the failure. See violation A.2.

b. Region III requested inspection of S&S to determine how S&S was handling the reporting of 10 CFR Part 21 matters, as a result of identification that diesel generator maintenance publications were not being forwarded to Commonwealth Edison La Salle County Station.

S&S had received a request from Commonwealth Edison in regard to this matter and had forwarded the request to EMD for action. Violation A.2 was identified as a result of the failure to adopt procedures for implementation of 10 CFR Part 21.

2. Follow-Up Item

San Onofre Nuclear Generating Station, Units 2 and 3 were experiencing problems with high crankcase oil pressure in their diesel generator units. S&S was evaluating the deficiency.

3. Implementation of 10 CFR Part 21

10 CFR Part 21 was posted. See violations A.1 and A.2.

4. Manufacturing Process Control

Travelers, inspection point program checklists, quality assurance work order files, personnel certifications, and other documentation were examined. Two units were in test berths, but no testing was being performed. See nonconformances B.1 through B.9.

In regard to nonconformance B.4, the Inspection Point Program for the fan assembly support (IPP #108) identified that postweld heat treat and machining operations had been performed on the assembly, respectively, on March 21, 1980, and April 8, 1980. IPP #108 showed also, however, that the fan assembly was not fabricated until March 26, 1981. In response to questions concerning the date inconsistencies, the NRC inspector was informed that the assembly had been rebuilt as a result of the discovery of dimensional errors. It was not established how it was possible for the same IPP record to be used for inspection operations during the second assembly fabrication, or why inspection operations had not been signed off for the initial fabrication.

ORGANIZATION: STONE AND WEBSTER ENGINEERING CORPORATION
NEW YORK, NEW YORK

REPORT NO.: 99900509/81-05	**INSPECTION DATE(S):** 12/1-4/81	**INSPECTION ON-SITE HOURS:** 43

CORRESPONDENCE ADDRESS: Stone and Webster Engineering Corporation
ATTN: Mr. R. B. Kelly
Vice President, Quality Assurance
P. O. Box 2325
Boston, MA 02107

ORGANIZATION CONTACT: Mr. F. B. Baldwin, Assistant QA Manager
TELEPHONE: (617) 973-6566

PRINCIPAL PRODUCT: Architect Engineering Services

NUCLEAR INDUSTRY ACTIVITY: Major projects include Beaver Valley 2, River Bend 1 and 2, Shoreham, Nine Mile Point 2, Millstone 3, North Anna 3, New Haven 1 and 2, Montange 1 and 2, and Jamesport 1 and 2. In addition, there are 44 modification/repair/service contracts. The aforementioned contracts cover work performed in the Boston, Cherry Hill, New York and Denver offices. The New York office is presently working on specific tasks for the following projects: Zion, Fitzpatrick, Salem 1 and 2, Beaver Valley 2, Surry 1 and 2, and North Anna 1 and 2.

ASSIGNED INSPECTOR: C J Hale for
D. D. Chamberlain, Reactor Systems Section (RSS) — 1-4-82 Date

OTHER INSPECTOR(S): I. T. Yin, Region III

APPROVED BY: C J Hale
C. J. Hale, Chief, RSS — 1-4-82 Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and Topical Report SWSQAP 1-74A.

B. SCOPE: Follow up on an NRC headquarters request relating to Stone and Webster's (S&W) methods for evaluation of personnel qualifications and assignment of personnel, technical inspection of Zion project 79-14 bulletin work, status of S&W committed action relative to a Region III identified unresolved item on S&W internal program audits (Zion project), and design process management.

ORGANIZATION: STONE AND WEBSTER ENGINEERING CORPORATION
NEW YORK, NEW YORK

REPORT NO.: 99900509/81-05	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Stone and Webster Methods for Evaluation of Personnel Qualifications and Assignment of Personnel - The purpose of this area of inspection was to verify that adequate information is available to supervisory personnel for proper assignment of personnel and for evaluation of training needs. Topical Report SWSQAP 1-74A and applicable procedures were examined to determine Quality Assurance program commitments. The available education, experience, and training records for 34 personnel were examined to verify implementation of the program commitments. Information is available to supervision through division records in the form of Experience Records which are prepared and updated on at least an annual basis to document current education, professional registrations, and work experience and in the form of a computer listing of training courses attended by personnel within each division. Of the 34 Experience Records examined, two were not updated annually as required. The failure to update Experience Records annually was issued as a nonconformance during the 81-04 inspection of the S&W Cherry Hill Operations Center. The action taken to correct the nonconformance will address S&W corporate action and should correct the apparently isolated cases at the New York office. During the examination of training records, it was noted that personnel were being exempted or were absent from training sessions without any documented justification or waiver. The waiver of training requirements is addressed in the revised S&W Quality Standard QS-2.12, Revision B, which is scheduled for full implementation by April 1, 1982. The revised QS requires documentation of any waivers of required formal training and also provides a formalized approach to training requirements for all S&W personnel performing activities affecting quality.

   Experience Records are maintained current and provide adequate information to supervision for assignment of personnel, and implementation of QS-2.12, Revision B, should provide an enhanced program for evaluation of training needs and requirements. This item is considered closed and no further follow up of this area of inspection will be conducted other than the close-out of the nonconformance identified in the S&W 81-04 report and normal programmatic inspections of training after full implementation of QS-2.12, Revision B.

2. Technical Inspection of Zion Project 79-14 Bulletin Work - An NRC Region III inspector participated in this inspection by conducting a technical inspection of the 79-14 bulletin work for the Zion project. No nonconformances

were identified. Since this area of inspection related specifically to one project (Zion), the results will be documented in a report to that licensee (Commonwealth Edison Company).

3. Program Audits - This area of inspection resulted from a request by the NRC Region III inspector to follow up on S&W's committed action on the Zion project relative to an unresolved item on program audits. This unresolved item was documented as item (295/80-19-09; 304/80-19-09) in Report No. 50-295/80-24; 50-304/80-26 to the Zion project licensee (Commonwealth Edison Company). The specific finding was that there appeared to be a lack of comprehensive program implementation audits by S&W. The licensee also identified this finding in their audit on November 24-25, 1980. Relative to this finding, S&W had committed to performing quarterly program audits on the Zion project. The status of this unresolved item is as follows:

   (Closed) Unresolved Item (295/80-19-09; 304/80-19-09): The applicable procedure and three internal audit reports issued in 1981 for the Zion project were examined. The fourth internal audit of the Zion project is now in progress and will be completed by the end of 1981. Within this area of this inspection, the S&W program commitments and requirements are being implemented.

4. Design Process Management - Topical Report SWSQAP 1-74A, and applicable S&W procedures were examined to determine Quality Assurance program commitments. One test procedure, two specifications, five calculations, and eight design drawings which related to three separate tasks on the Fitzpatrick project were examined to verify implementation of the program commitments. Within the scope of this inspection, the QA program commitments were being implemented.

ORGANIZATION: UNITED ELECTRICAL CONTROLS COMPANY
WATERTOWN, MASSACHUSETTS

REPORT NO.: 99900288/81-01	INSPECTION DATE(S): 11/19/81	INSPECTION ON-SITE HOURS: 16

CORRESPONDENCE ADDRESS: United Electrical Controls Company
ATTN: Mr. Robert Reis
Vice President and General Manager
85 School Street
Watertown, MA 02172

ORGANIZATION CONTACT: Mr. W. E. Cardillo, QC Manager
TELEPHONE: (617) 926-1000

PRINCIPAL PRODUCT: Temperature and Pressure Control Instruments

NUCLEAR INDUSTRY ACTIVITY: The nuclear output of this company, based on sales, is 0.7%.

ASSIGNED INSPECTOR: R. E. Oller — 12-30-81
R. E. Oller, Components Section (CS) — Date

OTHER INSPECTOR(S): L. B. Parker, Reactive Inspection Section

APPROVED BY: C. J. Hale for — 12-31-81
U. Potapovs, Acting Chief, CS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B, and 10 CFR Part 21.

B. SCOPE: Status of previous inspection findings and 10 CFR Part 21 implementation.

A. VIOLATIONS:

Contrary to paragraph 21.6 of 10 CFR Part 21, 10 CFR Part 21 regulations, Section 206 of the Energy Reorganization Act of 1974, and procedures pursuant to the regulations had not been posted.

B. NONCONFORMANCES:

1. Contrary to the preventive action commitment in United Electrical Controls' response letter, dated December 21, 1978, with regard to Deviations A and D, an interim complete QA audit of the Engineering Department in accordance with the QC Manual Section 14 and Procedure No. 5-3, had not been performed by February 16, 1979. (See paragraphs D.1 and D.3).

2. Contrary to the corrective action commitment in United Electrical Controls' response letter dated December 21, 1978, with regard to Deviation C, an audit of seven departmental manuals and procedures had not been performed by March 30, 1979. (See paragraph D.4).

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph III.A of QC Manual, section 16, dated May 31, 1978, written procedures had not been approved and issued by the Sales department (one of six departments) to establish methods for reporting of defects and noncompliances.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS - (R. E. Oller, Inspector):

1. (Open) Deviation A (78-01): Failure to write and issue manufacturing and test procedures by December 31, 1977, to control bellows filling and automatic welding, as committed to in the vendor's corrective action response letters dated October 12, 1977, and January 31, 1978.

   The inspector verified that in accordance with the vendor's corrective action response letter dated December 21, 1978, that the manufacturing and test procedure No. T-108, "Bellows Filling Procedure," was written and issued for use on January 1, 1979. This action provided the committed corrective action. However, the United Electrical Controls Company (UEC) commitment to provide preventive action by performing a complete quality assurance audit of the engineering department in accordance with the QC Manual Section 14 and procedure No. 5-3 by February 16, 1979, has not been performed. This nonconformance remains open.

2. (Closed) Deviation B (78-01): Failure to incorporate procedures for internal corrective action into the QC Manual as committed to in the vendor's corrective action response letter dated October 12, 1977.

   The inspector verified that in accordance with the vendor's corrective action response letter, dated December 21, 1978, that Section 19 "Corrective Action"

was written, issued and included in the QC Manual on January 9, 1979. This action satisfies the corrective action commitment and the implementation of this manual section will provide preventive action.

3. (Open) Deviation C (78-01): Failure to implement Quality Control Procedures Nos. 5-2 and 5-3 (audit procedures), as committed to in the vendor corrective action response letter, dated October 12, 1977.

   The inspector verified that contrary to the vendor's corrective action response letter dated December 21, 1978, that the corrective action commitment to audit the seven departmental manuals and procedures by March 30, 1979, has not been met. This item remains open. The preventive action commitment to revise the QC Manual Section 14 and QC procedures No. 5 and Nos. 5-1 through 5-7 was performed on May 31, 1978.

4. (Open) Deviation D (78-01): Failure to provide, in the drawing and change control section of the Engineering Manual, documented measures to provide control, issuance, review and approval of manufacturing and procedures and related changes, as required by paragraph 6 of the Engineering Procedure No. EMI-6, dated July 21, 1977, and paragraph 3.2 of Engineering Procedure No. EMI-3, dated July 21, 1977.

   The inspector verified that in accordance with the vendor's commitment in the corrective action response letter dated December 21, 1978, that the Engineering Procedure No. EM2-7, "Engineering Change Orders," was revised on January 31, 1979, to include provisions for control, issuance, review, and approval of manufacturing and test procedures. Although this action provides the committed corrective action, the preventive action of performing a complete audit of the Engineering Department by February 16, 1979, in accordance with the QC Manual Section No. 14 and QC Procedure No. 5-3, was not performed. Therefore, this item remains open.

E. OTHER FINDINGS OR COMMENTS - (L. B. Parker, Inspector):

10 CFR Part 21 Implementation - Records and procedures were examined to determine if 10 CFR Part 21 had been implemented. It had not been implemented as shown in paragraphs A. and B.3. above.

READEX FICHE best copy available

ORGANIZATION: UNITED ENGINEERS AND CONSTRUCTORS, INC.
PHILADELPHIA, PENNSYLVANIA

REPORT NO.: 99900510/82-01	INSPECTION DATE(S) 1/4-8/82 & 2/2-5/82	INSPECTION ON-SITE HOURS: 56

CORRESPONDENCE ADDRESS: United Engineers and Constructors, Inc.
ATTN: Mr. R. A. Curnane, Vice President
Project Support Operations
30 South 17th Street
Philadelphia, PA 19101

ORGANIZATIONAL CONTACT: Mr. J. B. Silverwood, QA Manager
TELEPHONE NUMBER: (215) 422-4744

PRINCIPAL PRODUCT: Architect Engineering Services

NUCLEAR INDUSTRY ACTIVITY: United Engineers and Constructors (UE&C) is the Architect Engineer on the following major projects: Seabrook, Units 1 and 2, and Washington Public Power Supply System, Units 1 and 4 (WNP - 1&4). Also, UE&C has active engineering service contracts on two nuclear plants for two utility clients.

ASSIGNED INSPECTOR: Dwight D. Chamberlain 3-3-82
D. D. Chamberlain, Reactor Systems Section (RSS) Date

OTHER INSPECTOR(S):

APPROVED BY: D F Fox for C.J. Hale 3/10/82
C. J. Hale, Chief, RSS Date

INSPECTION BASES AND SCOPE:

A. BASES: The PSARs, for the Seabrook and Washington Public Power Supply System projects and 10 CFR Part 50, Appendix B.

B. SCOPE: Status of previous inspection findings, design verification (UE&C home office design activities and UE&C WNP-1 field design activities) and a special inspection conducted as the result of a Region II request for follow up on the generic aspects at the Architect Engineer relative to the potential loss
(cont. on next page)

PLANT SITE APPLICABILITY:

This inspection relates to the following plant dockets: 50-324, 50-325, 50-443, 50-444, and 50-460.

ORGANIZATION: UNITED ENGINEERS AND CONSTRUCTORS, INC.
PHILADELPHIA, PENNSYLVANIA

REPORT NO.: 99900510/82-01	INSPECTION RESULTS:	PAGE 2 of 9

SCOPE: Cont.

of scram redundancy upon closure of two reactor instrument penetration valves as reported by Carolina Power & Light at the Brunswick 1 and 2 project.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of 10 CFR Part 50, Appendix B, and procedure GEDP-0034, the Reliability and Quality Assurance Department did not assure that the committed completion date was met for corrective action in response to a previous NRC inspection finding (Item B.1, Report 81-03).

2. Contrary to Criterion V of 10 CFR Part 50, Appendix B, and procedure PG-02, the transferring organization for three pipe stress analysis packages examined did not verify that the latest revision of the Composite/System Piping Drawing and Fabrication and Erection Drawing was referenced on the Analysis Drawing and, consequently, no evidence existed to indicate that the analysis drawing had been verified against the latest drawings.

C. UNRESOLVED ITEMS:

It was not apparent that program requirements were adequately defined and/or being followed in the preparation of nuclear pipe support design packages for transfer of responsibility to the WNP-1 site design group.

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Open) Nonconformance (81-03): QA records for the Seabrook Project are not being stored and/or adequately protected from damage or deterioration and audits of record storage areas are not being performed on a periodic basis.

   Procedure QA-17 was revised to designate the Record Retention Room as the Remote Correspondence File and to require duplicate storage of records of design reviews. A letter was issued to the NRC Quality Assurance Branch (QAB) on December 14, 1981, which describes the proposed duplicate storage facilities. The audits of the revised procedures and the record storage areas were not performed by

December 30, 1981, as committed. This item will remain open pending the response from QAB regarding the adequacy of the duplicate storage areas and pending the completion of the audits of the record storage areas. A nonconformance was issued (B.1 above) for the failure to meet a commitment to the NRC for completion of the record storage area audits. A new date of March 15, 1982, was committed during this inspection and a memo was submitted which stated that NRC inspection findings would be included in the R&QA Monthly Report with the status and responsibility for the corrective actions highlighted in the report cover letter.

2. (Closed) Nonconformance (81-03): Design changes are not being subjected to the same design control measures as the original design. A project change proposal (PCP) for WNP-1 was revised and approved without receiving the same review as the original issue.

   All of the previously processed PCPs which were revised after the initial review have been identified and the required review and approval of these revisions have been completed. Project procedure PP-41 has undergone a total revision which describes the requirements for revising and voiding of PCPs and the review requirements. UE&C management stated that they are having problems with the present revision to PP-41 and they would like to revise PP-41 again and remove some of the review requirements. The NRC inspector stated that this was no problem as long as UE&C procedures adequately state when and where the necessary design review and verification takes place. However, during the WNP-1 site inspection of UE&C design activities; field procedure FGCP-60 (Control Procedure for Drawings, Specifications and System Design Description) was examined which states that the checker must only verify that the requirements of the Design Change Document are correctly translated into the design document. Therefore, the use of procedure FGCP-60 would require all Design Change Documents to be verified against the design bases prior to approval. This area will be a subject in the scope of future inspections.

3. (Open) Nonconformance (81-03): Fabrication and final ship of feedwater isolation valves (Seabrook, Unit 1) by Borg Warner NVD (contract 248-36) was completed without a required UE&C vendor surveillance representative's witness of an inspection or test, or written consent by UE&C to waive the witness point.

   The witness point in question was the witness of Liquid Penetrant testing of the first valve body to neck weld and a subsequent review of the vendor's welder qualifications and NDE personnel qualifications.

Although the vendor surveillance check plan was not signed off, the following actions have or will adequately cover the missed witness point.

a. The review of NDE personnel and welder qualifications was accomplished prior to the start of fabrication as a part of UE&C's annual Quality Assurance Audit of the vendor.

b. The review of material test reports was accomplished during review of the Site Document Package at final inspection of the valve.

c. The performance of the nondestructive test was verified during review of the Site Document Package. Witnessing of the NDE will be accomplished on the first Unit 2 valve. Unit 2 valves have not been released for fabrication.

The UE&C Audit Group also reviewed a sample of other orders for missed surveillance points and no problems were identified. The NRC inspector examined the vendor surveillance file for PO 170-1 (Main Control Board-York Electro Panel) and there was no evidence in the file that two required witness points were accomplished. These points were
(1) Witness of vendor's storage area for purchased equipment; and
(2) Witness of dynamic test on Panel "E".

The necessary documentation for the above witness point was generated and placed in the file during this inspection. Based on the NRC review of this order and the problems identified, UE&C management has committed to a review of all safety related orders on the Seabrook project for completion of required vendor surveillance. This review will be completed by March 15, 1982, and the NRC inspector will review the results during the next inspection.

E. OTHER FINDINGS OR COMMENTS:

1. Design Verification - This area of inspection was conducted at the UE&C Philadelphia office on January 4-8, 1982, with a follow up inspection of the WNP-1 UE&C field design activities conducted at the WNP-1 site on February 1-5, 1982. The results of the inspections were as follows.

ORGANIZATION: UNITED ENGINEERS AND CONSTRUCTORS, INC.
PHILADEPHIA, PENNSYLVANIA

REPORT NO.: 99900510/82-01	INSPECTION RESULTS:	PAGE 5 of 9

a. Philadelphia Office - Section 17.2 of the WNP-1 project PSAR and applicable procedures were examined to determine UE&C QA program commitments. A design drawing schedule, six design drawings, eight calculations, four specifications, three design change documents, pipe support software master index and five pipe support drawings and associated calculations were examined to verify program implementation. All of the design documents examined were for the WNP-1 project with special emphasis placed on a review of the process of transferring design responsibility to the UE&C site engineering group. An unresolved item was identified in the preparation of pipe support design packages (see C. above). Nuclear pipe support design packages are being prepared for the transfer of "as designed" information to the field design group. These packages include the pipe support drawings along with backup calculations. The field engineering group will be required to review and approve the as-designed issue of the support drawing. The procedure for developing the design packages is presently in the review stage and the packages examined were in process. Potential problems identified were at least one case where a calculation page for a previously issued revision had not been checked and one case where load data was written in red on a load data sheet and subsequently used in the support calculations. Due to the in process status of these packages, it could not be determined if program requirements were being implemented. This area will be examined further during a future inspection.

b. WNP-1 Site - The site inspection resulted from a Region V concern relative to a potential lack of design verification of pipe support calculations and potential problems with the UE&C interface with the electrical and heating/ventilating/air conditioning (HVAC) contractors in the areas of cable tray support design and HVAC duct support design. In addition to the Region V areas of concern, emphasis was also placed on a review of the interface control between the UE&C home office design group and the UE&C field design group. The following design documents were examined during the course of the inspection: pipe support software master index, five pipe support detail drawing packages, three stress analysis packages (including stress isometric, computer printout, load data sheets, composite drawings, field and erection isometrics and pipe support details), cable tray installation

drawing, cable tray support detail drawings, technical specification for cable tray installation, HVAC duct support installation drawing, HVAC duct support detail drawings and two system descriptions.

Within the scope of this inspection, the following findings/observations were made:

(1) The control of the interface between the home office design group and field design group for transfer of design responsibility has been addressed in two new procedures. They are PP-47 (Closeout and Transfer of Design Documents) and PSG-1-1004 (Nuclear Pipe Support Calculation Closeout Program). These procedures are now in the review cycle. A nonconformance was identified relative to the transfer of stress analysis packages to the field design group. The transferring organization did not verify at the time of transfer that the latest Fabrication and Erection Drawings and Composite/System Drawings were referenced on the analysis drawing as required by Piping Guidelines (PG) No. 2 (see B.2 above), and no evidence existed to indicate that the analysis drawings had been verified against the latest drawings. PP-47 will replace PG-2 for the transfer of analysis packages and the implementation of PP-47 and PSG-1-1004 will be monitored during future NRC inspections.

(2) The concern of a potential lack of design verification of pipe support calculations originated from the method that was being used by the field design group for pipe support calculations. The field design group would issue "preliminary" calculations in order to revise a pipe support drawing. These preliminary calculations would have to be transferred to the home office design group for incorporation into the originally approved calculations which were controlled by the home office design group. The home office design group would be required to incorporate the preliminary calculation into the original and then conduct the design verification and approval. A copy of the approved calculation would then be issued to the field design group for their use in revising the support drawing. The preliminary calculations issued by the field were unverified documents, but they were later incorporated into verified calculations in accordance with applicable procedures.

ORGANIZATION: UNITED ENGINEERS AND CONSTRUCTORS, INC.
PHILADELPHIA, PENNSYLVANIA

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A Region V NRC inspector assisted the Region IV inspector in this area of inspection and the following additional observations were made:

(a) The snubber stiffness values being used in the seismic analysis are significantly higher than the manufacturer supplied values. UE&C procedures require a check of the stiffness values used against the manufacturer's values during the finalization of the pipe stress calculations.

(b) Programmatic calculators are being used by the field design group for preparation of preliminary pipe support calculations. Although no formal procedure existed for control of the use of programmable calculators, no problems were found in the methods of control and a draft procedure has been issued for formal control.

(c) All of the approved pipe support calculations are presently classified as "preliminary calculations" and the UE&C program requires that all preliminary calculations be either voided or made final. UE&C plans to finalize all of the pipe stress and pipe support calculations during the as-built pipe support program.

(3) The interface between UE&C and the electrical and HVAC contractors is being controlled by providing the contractor with a "cookbook" design document for selection of support types/options to be used at specific locations. The contractors must provide UE&C with as-built support drawings for UE&C review and approval. The UE&C review and approval will be the required design check/verification for the support design. The cookbook design document for cable tray supports is now at revision 21 and UE&C personnel stated that the as-builts would be verified against the latest revision of the cookbook for both contractors. The verification of the cookbook design was conducted at the UE&C home office and this verification will be examined during a future inspection.

(4) The final area examined during this inspection was System Design Descriptions (SDDs). The formal review of the SDDs was conducted by the home office design group and the SDDs provide the design bases for other design documents. Design verifiers are required to check the design documents with the applicable SDDs during the verification process. The original SDDs are now controlled by the field design group. The records of design verification for SDDs and the use of SDDs for design verification of other design documents will be examined during a future inspection at UE&C.

2. Potential Loss of Scram Redundancy Upon Closure of Two Reactor Instrument Penetration (RIP) Valves - This area of inspection resulted from an NRC Region II request for follow up on the generic aspects at the Architect Engineer (AE) relative to an event reported by Carolina Power & Light at the Brunswick 1 and 2 plant.

The event related to the failure of an air operated RIP valve which caused a feedwater control problem that subsequently caused a low water level reactor scram. The closed RIP valve blocked one low level scram sensor in each reactor protection system channel. A review was made at UE&C of the available design documents and correspondence relative to the design and the subject was discussed with UE&C personnel presently assigned to the Brunswick contract work. The following findings/conclusions were reached from the review at UE&C:

a. The design using air operated RIP valves was developed in 1971 to meet the interpreted requirements of Safety Guide 11 dated March 10, 1971.

b. The original issue of the FSAR described the present design.

c. The design has no generic implications at UE&C, since UE&C has been the AE on only one BWR design.

The FSAR Section 7.2 for the design basis of the Reactor Protection System was reviewed and it may be that the event described is in violation of the requirement stated as follows:

"Where a plant condition that requires a reactor scram can be brought on by failure or malfunction of a control or regulating system, and

the same failure or malfunction prevents action by one or more reactor protection system channels designed to provide protection against the unsafe condition, the remaining portions of the reactor protection system shall meet the requirements of safety design bases 1, 2, 3, and 7a." Safety design bases 7a states "No single failure within the reactor protection system shall prevent proper reactor protection system action." A failure of another RIP valve for the redundant channels could cause the low level scram function (+12.5") of the reactor protection system to be defeated. However, the failure of only one RIP valve blocks the action of one sensor in each channel and does not actually prevent protection action of either channel.

A review of documentation relating to a second reportable event which was later withdrawn, indicates that the licensee felt that there was a potential violation of paragraph 4.7.3 of IEEE Standard 279-1971 for random failures. The IEEE Standard basically states the same requirement as the FSAR for the reactor protection system. The stated basis for withdrawing the report was: "Further investigation of this issue, including discussions with knowledgeable NRC personnel from the Office of Nuclear Reactor Regulation has determined that the scope of IEEE 279-1971 is narrower than had been our earlier belief. With the clarification that this particular IEEE standard is applicable only for circuitry from the sensor to the actuation device input terminals, the Brunswick plant is in compliance with this standard and there is no reportable event." However, the FSAR design basis for the reactor protection system does not restrict itself to the circuitry. Therefore, this item has been referred to NRC Region II for resolution with the licensee and since there are no generic design aspects at UE&C this item is considered closed with respect to UE&C.

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
PENSACOLA PLANT
PENSACOLA, FLORIDA

REPORT NO.: 99900104/82-01	INSPECTION DATE(S): 1/18-22/82	INSPECTION ON-SITE HOURS: 26

CORRESPONDENCE ADDRESS: Westinghouse Electric Corporation
Pensacola Plant
ATTN: Mr. T. D. Miller,
Manager, Product Assurance
P. O. Box 1313
Pensacola, Florida 32596

ORGANIZATIONAL CONTACT: Mr. T. D. Miller, Manager, Product Assurance
TELEPHONE NUMBER: (904) 477-0535

PRINCIPAL PRODUCTS: Nuclear Reactor Vessel Internals, Steam Generators and Pressurizers

NUCLEAR INDUSTRY ACTIVITY: The Pensacola plant nuclear components work represents 98% of the plant workload.

ASSIGNED INSPECTOR: J Barnes for R. E. Oller, Reactive & Components Program Section (R&CPS) — 3-2-82 Date

OTHER INSPECTOR(S):

APPROVED BY: J. Barnes I. Barnes, Chief, R&CPS — 3-2-82 Date

INSPECTION BASES AND SCOPE:

1. BASES: 10 CFR Part 50, Appendix B and 10 CFR Part 21.

2. SCOPE: Manufacturing process control, nonconformances and corrective action, welding material control, welder qualifications, NDE personnel qualifications, and 10 CFR Part 21 implementation.

PLANT SITE APPLICABILITY:

The scope of the inspection included review of equipment/records for Docket 50-424.

ORGANIZATION: WESTINGHOUSE ELECTRIC CORP.
PENSACOLA PLANT
PENSACOLA, FLORIDA

REPORT NO.: 99900104/82-01	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATIONS:

None

B. NONCONFORMANCES

None

C. UNRESOLVED ITEMS

None

D. OTHER FINDINGS OR COMMENTS:

1. Manufacturing Process Control: The inspector reviewed four sections of the W-NCD Pensacola Plant QA Manual, which were applicable to control of material receiving, fabrications, inspections and tests of nuclear reactor vessel internals, steam generators and pressurizers.

   Observations were made of in-process welding fabrication of four Model F steam generators for the Georgia Power, A. W. Vogtle Nuclear Power Plant.

   To verify that the fabrication and inspections were controlled and documented in accordance with requirements, review was made of: three approved Westinghouse (W) specifications; a W topical report; in-process Manufacturing Routings (travelers); Material Review Reports; a Detailed Manufacturing Procedure for welding; welder and NDE personnel qualification records, and five Quality Inspection Procedures, all related to work in-process on the above four identified steam generators.

   Within this area, no nonconformances to NRC, customer, or QA program requirements were identified and no unresolved items were identified.

2. Nonconformances and Corrective Action: The inspector reviewed two sections of the W-NCD Pensacola Plant QA Manual, which were applicable to control and disposition of nonconformances in materials and work.

   To verify that nonconforming items were reviewed and accepted, rejected, repaired, or reworked, and that conditions adverse to quality, including the cause, are promptly identified and corrected, a review was made of:

four approved procedures governing the use of various nonconforming material forms; four Material Review Reports related to operations on the routings for the previously identified steam generators; an MRR Log maintained in the Material Review Board hold area; five Material Reject Notices for unacceptable materials received from suppliers, an MRN Log maintained in the receiving inspection area; three Supplier Approval Requests for materials on hold at the suppliers facilities, and three Hold Tags associated with nonconforming materials in the MRB hold area.

Within this area, no nonconformances to NRC, customer or QA program requirements were identified, and no unresolved items were identified.

3. Welding Material Control: The inspector reviewed paragraph 9.3.5, "Control of Weld Related Materials," in the Pensacola Plant QA Manual.

Observations were made of the welding wire, flux, and coated rod storage facilities and hot ovens maintained in the weld material issue crib. To verify that weld material issuance was controlled and documented, discussions were held with the personnel performing the material issuance and a review was made of records which included: a Weld Wire Inventory Log; a Procedure and Weld Material Category Log; a Master Welder Qualification List; completed Weld Status issue sheets; a List of Approved Wire and Flux, an in-process welding procedure; and the qualification record of the welder performing the welding on a steam generator.

Within this area, no nonconformances to NRC, customer or QA program requirements were identified, and no unresolved items were identified.

4. Welder Qualifications: The inspector reviewed paragraph 9.3.3 "Personnel Qualification" of the Pensacola Plant QA Manual, which was applicable to this subject.

To verify that welders were qualified in accordance with the ASME Code, review was made of current ASME Section IX welder performance qualification records for eight active welders qualified to the welding processes in greatest use at the Pensacola plant. Review also included the current Master Welder Qualification List.

Within this area, no nonconformances to NRC, ASME Code or QA program requirements were identified, and no unresolved items were identified.

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
PENSACOLA PLANT
PENSACOLA, FLORIDA

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5. NDE Personnel Qualification: The inspector reviewed paragraph 9.4.3 "Product Assurance/NDE Personnel Training, Qualification and Certification" of the Pensacola Plant QA Manual.

To verify that the NDE personnel were trained, qualified, and certified in accordance with requirements, review was made of the procedure governing these activities, and current records consisting of: NDT Education and Experience, written SNT-TC-1A examinations, Certification Histories for the techniques of visual, dye penetrant, magnetic particle radiographic and ultrasonic examinations, also, records of current eye examinations for four NDE Level II technicians and the Level III Examiner were reviewed. Review also included a blanket recertification letter for all NDE technicians at the Pensacola plant for the techniques for which each person was qualified.

Within this area, no nonconformances to NRC, ASME Code or QA program requirements were identified, and no unresolved items were identified.

6. 10 CFR Part 21: The inspector reviewed the Pensacola procedure No. PE-12-12-005, Revision 3, "Reporting of Significant Deficiencies, Unreviewed Safety Problems, and Substantial Safety Hazards," to verify that adequate documented measures were available to meet the reporting requirements of 10 CFR Part 21.

Observations were made of several bulletin boards, on which were posted copies of the Westinghouse policy-procedure which included Section 206 of the Energy Reorganization Act of 1974, and 10 CFR Part 21.

Within this area, no violations were identified.

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION, INSTRUMENTATION DEPARTMENT
HUNT VALLEY, MARYLAND

REPORT NO.: 99900217/81-02	INSPECTION DATE(S): 11/16-19/81	INSPECTION ON-SITE HOURS: 28

CORRESPONDENCE ADDRESS: Westinghouse Electric Corporation
Instrumentation Department
ATTN: Mr. J. F. Heins, General Manager
1111 Schilling Road
Hunt Valley, MD 21031

ORGANIZATION CONTACT: Mr. R. W. Lee, Product Assurance Manager
TELEPHONE: (301) 667-5532

PRINCIPAL PRODUCT: Electronic components and controls.

NUCLEAR INDUSTRY ACTIVITY: About 75% of manufacturing is commercial nuclear work. Solid State Protection Systems, Nuclear Instrumentation Systems, Digital Rod Position Indication Systems, Reactor and Containment Vessel Level Monitoring Systems, and Technical Support Centers are some of the product lines.

ASSIGNED INSPECTOR: C J Hale/hor — 1-4-82
W. M. McNeill, Components Section (CS) — Date

OTHER INSPECTOR(S):

APPROVED BY: Uldis Potapovs — 1-4-82
U. Potapovs, Acting Chief, CS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: Nonconformances and corrective action; calibration; procurement controls; and status of previous inspection findings.

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION, INSTRUMENTATION DEPARTMENT
HUNT VALLEY, MARYLAND

REPORT NO.: 99900217/81-02	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to the QA Manual, Section 14.1 and Criterion V of Appendix B to 10 CFR Part 50, two Inspection Control Tags were found with incorrect and missing information.

2. Contrary to the QA Manual, Section 7.1, and Criterion V of Appendix B to 10 CFR Part 50, two Corrective Action Requests (CARs) for vendor nonconformances were either not initiated or were voided.

3. Contrary to the QA Manual, Section 8.2 and Criterion V of Appendix B to 10 CFR Part 50, three cases were found where defects were not logged or were logged incorrectly.

4. Contrary to the QA Manual, Section 3.6 and Criterion V of Appendix B to 10 CFR Part 50, independent verification of vendor test results has not been performed for the last four months.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Nonconformance (81-01): A method of design change verification was used which was not described in Quality System Requirements. The forms used have been modified to remove the method in question. The design control procedure will be revised to reflect this change. A review of verification activities found no further problems.

2. (Closed) Nonconformance (81-01): Inspection Control Tags did not have the latest revision of applicable drawings and initials of personnel. Instruction classes were held for personnel. A review of Inspection Control Tags found no further problems in this specific area, however, another nonconformance was identified in this area.

3. (Closed) Nonconformance (81-01): A change to a drawing in use was not properly documented. Instruction classes were held for personnel. A review of drawings found in use in the shop found no further problems.

E. OTHER FINIDNGS OR COMMENTS:

1. Nonconformances and Corrective Action - The Material Review Board (MRB) activities for the past six months was reviewed. This included 21 reports. The review, disposition, and documentation of nonconformances followed procedures. Corrective action was documented for internal activities, however,a nonconformance was identified in this area regarding vendor corrective action. During this timeframe eight Material Rejection Notices had been dispositioned by MRB with vendor CARs. Defects and quality trends were summarized and reported. Weekly Defect Summary and Inspection Submittal and Discrepancy Records were reviewed. Hardware in the shop was reviewed for proper identification of defects. One nonconformance was identified in this area.

2. Calibration - Sixteen instruments and 10 crimping tools were inspected. Instruments and tools were found to be labeled properly. Records and procedures were found which established the acceptance limits, schedules, and results of calibration.

3. Procurement Controls - The purchase order for three components for the Solid State Protection Systems were reviewed in detail. Cabinets, relays, and power supplies were the items on these purchase orders. The use of the Approved Vendor List, vendor evaluation and history was verified to follow the approved procedures. Vendor history files which include Survey Reports, Audit Checklists, Source Reports, Vendor Quality Rating System, Detail Reports, Questionable Vendor Reports, and Certified Vendors Reports were inspected. In this area one nonconformance was identified. An open item for follow up during a later inspection was also identified. The vendor certification and test data could not be found for some Class 1E power supplies on purchase order 02D-ASP 87737 which were inspected on April 25, 1981.

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
INDUSTRIAL & GOVERNMENT TUBE DIVISION
HORSEHEADS, NEW YORK

REPORT NO.: 99900324/81-01	INSPECTION DATE(S): 12/14-18/81	INSPECTION ON-SITE HOURS: 24

CORRESPONDENCE ADDRESS: Westinghouse Electric Corporation
Industrial & Government Tube Division
ATTN: Mr. C. R. Johnson
General Manager
Westinghouse Circle
Horseheads, NY 14845

ORGANIZATION CONTACT: Mr. W. F. Massey, Manager, Quality Assurance
TELEPHONE: (607) 796-3318

PRINCIPAL PRODUCT: Electrical Penetration Assemblies (EPAs) and Radiation Detectors (RDs).
NUCLEAR INDUSTRY ACTIVITY: Twenty-three percent of production devoted to nuclear products used by the Electrical Utilities (14.4% RDs and 8.6% EPAs). There are seven active contracts for 341 EPAs and nine active contracts for 103 RDs.

ASSIGNED INSPECTOR: J. Barnes for L. B. Parker, Reactive Inspection Section (RIS) — 1-22-82 Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes, Chief, RIS — 1-22-82 Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B; and 10 CFR Part 21.

B. SCOPE: This inspection was made as a result of the issue of: (1) a potential Construction Deficiency Report by Houston Lighting and Power Company (HL&P), South Texas Project (STP), pertaining to the exposure of several conductors in one electrical penetration as a result of a cut in the wire bundle insulation; (2) a 10 CFR Part 50.55(e) report by Southern California Edison Company, San Onofre Nuclear Generating Station, Units 2 and 3, involving improper assembly of coaxial connectors on electrical containment penetrations; (3) a 10 CFR Part 50.55(e) report by HL&P, STP, concerning cable manufactured by Rockbestos Company which had been used in electrical penetrations supplied by Westinghouse. This inspection also covered previously identified items and implementation of 10 CFR Part 21.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Process Spec. No. 252-1-38, Revision B, dated December 14, 1981, ET-2550 Forms had not been filled out for any defects or noncompliances suspected to be reportable to the NRC.

C. UNRESOLVED ITEMS:

1. (Closed) Deviation A (79-01): Weld performance compliance with approved welding procedures and traveler instructions was not being determined by Quality Control.

   The inspector interviewed Welding Engineering and QC personnel in the EPA welding shop. The QC weld verification log book, welding procedures, 213-6-2, 213-3-20, and QC Procedure 10-3 were reviewed.

   Weld Specifications 213-6-2 and 213-3-20 had been modified on October 15, 1979, a QC weld verification log book was put into effect on October 3, 1979, and QC Procedure 10-3 was completed on October 15, 1979, as stated in the Westinghouse Electric Corporation Industrial & Government Tube Division (W I&GTD) letter of October 24, 1979.

2. (Closed) Deviation B (79-01): Welding materials issued for use in Operation 3 of S/N 102 bulkload assembly traveler, Order No. 13-PLA-364-LC, were not logged in the welding log book, in that E7018, Heat No. 401S6282 electrodes were issued but recorded in the welding log book as an issue of Heat No. 21224.

   The inspector interviewed Electrical Penetration Manufacturing personnel and reviewed welding log book (weld filler material issue) entries.

   The welding materials log book error had been corrected on July 10, 1979, but no documentation was available that personnel had been reinstructed to the proper procedure. A welding log book was being maintained in accordance with QC Procedure 10-3, which required that a QC audit be accomplished during each 8 hour shift in which one or more code operation was performed. One of the audit elements certified to is "the weld filler log is properly maintained and shows the proper material being drawn out for the weld being observed."

3. (Closed) Deviation C (79-01): Purchase Order 95C-08133 was originated for the procurement of lifting loop material and reviewed and signed by Quality Control, but omitted an applicable material specification requirement for the supply of Ceritified Material Test Peports.

The inspector reviewed section 4 of the Quality Program Manual (QPM) and three purchase orders.

Subsequent to the WI&GTD January 7, 1980, response to Deviation C (79-01) QPM had been rewritten. Section 4 delineates the control of Purchases and contains a checklist form ET-2662R4 designed to prevent the above deficiency for a Code or safety-related item or service. The P.O.s reviewed indicate that this new system has been implemented.

4. (Closed) Deviation D (79-01): A purchased item, identified by incoming inspection on Material Review Notice (MRN) 4131 as being too short, was released to manufacturing without receipt of the pink copy containing the required QC ANI and approvals for the proposed accept-as-is disposition. The white copy of MRN 4131 was retained by incoming inspection and did not remain with the item.

   The inspector reviewed section 10 of the QPM and identified the QPM was rewritten subsequent to the WI&GTD January 7, 1980, response to Deviation D (79-01). Section 10 delineates Nonconformances & Corrective Action which covers the use of the MRN. Section 10 as presently written resolves the Deviation D (79-01) deficiency.

5. (Open) Unresolved Item I.C.3.c. (79-01): Deficient soldered pin connectors require repair (WPPSS, WNP-2).

   Evidence could not be presented that: (1) the WPPSS, WNP-2 EPA installation, repair, and checkout were final; (2) that WI&GTD had analyzed the defective EPA's or had initiated activities to preclude reoccurence of this type; and (3) that the evaluation of the WNP-2 Project EPA deficiencies had been performed under 10 CFR Part 21. (See nonconformance).

6. (Closed) Unresolved Item I.G.3.b.: Purchase Order failed to adequately and coherently identify all required codes and standards requirements for procurement of electrical cable for electrical penetration assemblies.

   Subsequent to the inspection a review of three purchase orders was made with the concurrence of the initiator of the original deficiency.

   From this review, it was determined that these purchase orders adequately and coherently identify all required codes and standards requirements for procurement of electrical cable for electrical penetration assemblies.

7. (Closed) Unresolved Item II.B.3.b.: Absence of temperature measurement equipment in production welding area to provide capability for measurement of preheat and interpass temperatures.

   The inspector observed a temperature gauge (Omega CR/C Type E T/C Serial No. 5283) which was assigned to the production welding area to measure preheat and interpass temperatures.

8. (Closed) Unresolved Item II.B.3.b.: Inadequate definition of scope of QA program procurement controls applicable to different categories of electrical penetration assembly items.

The inspector reviewed QPM sections 4 and 7, and Quality Control Procedure (QCP) 4-10.

Subsequent to the 79-01 inspection, the QPM was rewritten. In the new QPM, section 4 defines the applicable procurement document controls and establishes a controlled vendor approval system. QPM section 7 in conjunction with QCP 4-10 defines the receiving inspection criteria. These documents combine to clarify the scope of procurement controls applicable to different boundary materials, nonpressure boundary (safety-related) and nonpressure boundary (nonsafety-related).

9. (Closed) Unresolved Item II.E.3.b.: Near distance acuity test card used for vision examinations of NDE personnel could not be clearly established as being the required Jaeger J-1.

   The inspector examined two near distance acuity test cards, and reviewed six physical examination records.

   Two Jaeger J-1 Reading Cards were used to administer visual examinations: (1) Reading Card (Metric) by American Society for Nondestructive Testing, Columbus, Ohio, Janaury 1978; and (2) Reading Card Bausch & Lomb, Rochester, New York 14602, 713565-101, IM-X-69. Review of the six individual inspection personnel Physical Examination Records for six inspection personnel showed that all had been reexamined with the above near distance acuity test Jaeger J-1 test cards between August 16, 1979, and August 21. 1979.

E. OTHER FINDINGS OR COMMENTS:

1. Regional Requests

   a. A potential Construction Deficiency Report was issued by HL&P, STP, pertaining to the insulation on the wire bundle of one electrical penetration being cut and exposing several conductors. In the November 13, 1981, final report HL&P determined that this was nonreportable and a safety hazard did not exist. WI&GTD on December 16, 1981, completed a ET-2550 (10 CFR Part 21 evaluation) form and concurred with the HL&P resolution; i.e., repair damaged jacketing with qualified heat shrink sleeve material and test, recurrence control not deemed necessary.

   b. A July 21, 1981, 10 CFR Part 50.55(e) Report made by Southern California Edison Company stated, "During an investigation of vendor installed series N coaxial connectors located in the Unit 2 Electrical Containment Penetrations, copper wire rings (18 gauge) were found in the female jack connectors, apparently being used as spacers. This provided inconsistent clearance between the face of the connector jack and the end of the center conductor female contact, resulting in a mating problem between the connector jack and plug. Nonconformance reports for Units 2 and 3 were issued to correct the assembly interference that existed between the center female conductor pin and the face of the connector jack. In the process of implementing the disposition of the nonconformance reports, the additional conditions of improper assembly which are noted below were discovered."

In an October 8, 1981 memo to Bechtel Power Corporation, WI&GTD takes the position that they assembled the coaxial connectors in accordance with their manufacturing drawings and specifications which do not use any copper wire rings, and the rings used as spacers were added without WI&GTD approval.

On December 11, 1981, WI&GTD initiated Product Change Notice 1377 "to provide inspection instructions on pin location of Coax connector."

c. A 10 CFR Part 50.55(e) Deficiency Report made by HL&P, STP, stated that HL&P was advised by letter from Westinghouse that Rockbestos had identified to them (WI&GTD) a potential for failure of certain coaxial cables. WI&GTD supplied EPAs and N-16 Junction Boxes (WL-24051) using the cable. W has notified their customers of the deficiency. W NES plans to run a qualification LOCA test to determine capability of the 24040 (similar to 24051). WI&GTD oven testing on September 4, 1981, simulating high energy line break (HELB) caused a short in one cable and a low resistance on another.

2. Implementation of 10 CFR Part 21

Reviewed WI&GTD Process Spec. No. 252-1-38, Revision C, dated December 14, 1981, Reporting of Defects and Noncompliance to verify that procedures had been written in compliance with paragraph 21.21 of 10 CFR Part 21. The above procedure had been written but not complied with (see nonconformance). Posting of 10 CFR Part 21 was observed and found to be in compliance with paragraph 21.6 of 10 CFR Part 21.

3. Follow-up Items

The results of the LOCA testing in paragraph E.1.c. and planned corrective actions for the coaxial cable deficiency will be reviewed during a subsequent inspection.

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611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011

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16. ABSTRACT *(200 words or less)*

This periodical covers the results of inspections performed by the NRC's Vendor Program Branch that have been distributed to the inspected organizations during the period from January 1982 through March 1982. Also included in this issue are the results of certain inspections performed prior to January 1982 that were not included in previous issues of NUREG-0040.

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LICENSEE CONTRACTOR AND VENDOR INSPECTION STATUS REPORT

QUARTERLY REPORT
APRIL 1982- JUNE 1982

UNITED STATES NUCLEAR REGULATORY COMMISSION

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LICENSEE CONTRACTOR AND VENDOR INSPECTION STATUS REPORT

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PREFACE

A fundamental premise of the Nuclear Regulatory Commission's (NRC) nuclear facility licensing and inspection program is that a licensee is responsible for the proper construction and safe operation of nuclear power plants. The total government-industry system for the inspection of nuclear facilities has been designed to provide for multiple levels of inspection and verification. Licensees, contractors, and vendors each participate in a quality verification process in accordance with requirements prescribed by, or consistent with, NRC rules and regulations. The NRC inspects to determine whether its requirements are being met by a licensee and his contractors, while the great bulk of the inspection activity is performed by the industry within the framework of sequential ongoing quality verification programs.

In implementing this multilayered approach, a licensee is responsible for developing a detailed quality assurance plan as part of his license application. This plan includes the quality assurance programs of the licensee's contractors and vendors. The NRC reviews the licensee's and contractor's quality assurance plans to determine that implementation of the proposed quality assurance program would be satisfactory and responsive to NRC regulations.

Firms designing nuclear steam supply systems, architect engineering firms doing design work on nuclear power plants, and certain selected vendors are currently inspected on a regular basis by the NRC. NRC inspectors, during periodic inspections, ascertain through direct observation of selected activities (including review of processes and selected hardware, discussions with employees and selected record review) whether a licensee or contractor is satisfactorily implementing a quality assurance program. If nonconformances with QA commitments are found, the inspected organization is requested to take appropriate corrective action and to institute preventive measures to preclude recurrence.

In addition to the QA program inspections, NRC also conducts reactive inspections of the licensee's contractors and vendors. These are special, limited scope inspections to verify that organizations supplying safety-related equipment or services to licensed facilities are exercising appropriate corrective/preventive measures when defects or conditions which could adversely affect the safe operation of such facilities are identified and that these organizations are complying with the NRC requirements which govern the evaluation and reporting of such conditions.

In the case of the principal licensee contractors, such as nuclear steam supply system designers and architect engineering firms, the NRC encourages submittal of a description of corporate-wide quality assurance programs for review and acceptance by the NRC Office of Nuclear Reactor Regulation (NRR). Upon acceptance by NRR, described quality assurance programs provide written bases for inspection on a generic basis, rather than with respect to specific commitments made by a particular licensee. Once accepted by NRR, a corporate quality assurance program of a licensee's contractor will be acceptable for all license applications that incorporate the program by reference in a Safety

Analysis Report. In such cases, a contractor's quality assurance program will not be reviewed by NRR as part of the licensing review process, provided that the incorporation in the SAR is without change or modification. However, new or revised regulations, Regulatory Guides, or Standard Review Plans affecting quality assurance program controls may be applied by NRR to previously accepted quality assurance programs.

The NRC Region IV Office In Arlington, Texas, inspects the implementation of quality assurance programs of nuclear steam supply system designers and architect engineering firms which have been submitted to, and approved by, NRR in the form of Topical Reports or Standardized Programs. Upon completion of inspections confirming satisfactory implementation of QA programs, NRC will issue a confirming letter to the nuclear steam system supplier or architect engineering firm.

Licensees and applicants that have referenced the NRR approved Topical Report, or Standardized Program, in Safety Analysis Reports (or have adopted the total quality assurance program described in the Topical Report or Standardized Program) may, at their option, use the confirming letter to fulfill their obligation under 10 CFR Part 50, Appendix B, Criterion VII, that requires them to perform initial source evaluation audits and subsequent periodic audits to verify quality assurance program implementation. For additional details concerning the NRC letter, refer to "SAMPLE LETTER" included in this report.

Licensees or construction permit holders may choose not to make use of a contractor's NRC accepted program, or such an accepted program may not exist. In such cases, the Region IV inspections of nuclear steam supply system designers, architect engineering firms, or other licensee contractors, sub-tier contractors, or suppliers, will be based on programs developed to meet the commitments made by the licensee or construction permit holder. These Region IV inspections will not relieve the licensees or applicants from any inspection/verification responsibilities required by Criterion VII.

The NRC currently is continuing their evaluation of a proposed program for NRC acceptance of third-party (ASME) certification of Vendor Quality Assurance programs. Should the proposed program be endorsed by NRC, it is anticipated that, subject to NRC audits of the third-party program, licensees and applicants would be able to use the ASME nuclear certification and inspection system to fulfill that part of their obligation under 10 CFR Part 50, Appendix B, Criterion VII, which required them to perform initial source evaluation/selection audits and subsequent periodic audits to assess the quality assurance program implementation.

A third party category of firms consists of organizations whose quality assurance programs or manufacturing processes have not been reviewed and approved by NRR, or by a third party (such as ASME). This category of firms is subject to NRC inspection based on the safety significance and performance of products or services provided by such firms. Since such firms will not receive a third-party review of their QA programs, results of the direct NRC inspections may not be used to fulfill the licensees's obligations under Criterion VII.

The White Book contains information normally used to establish a "qualified suppliers" list; however, the information contained in this document is not adequate, nor is it intended to stand by itself as a basis for qualification of suppliers.

Correspondence with contractors and vendors relative to the inspection data contained in the White Book is placed in the USNRC Public Document Room, located in Washington, D.C.

Copies of the White Book may be obtained at a nominal cost by writing to the National Technical Information Service, Springfield, Virginia 22161.

ORGANIZATION: COMPANY, DIVISION
CITY, STATE

REPORT NO. Docket/Year Sequence	INSPECTION DATE(S):	INSPECTION ON-SITE HOURS:

CORRESPONDENCE ADDRESS: Corporate Name
Division
ATTN: Name/Title
Address
City/State/Zip Code

"SAMPLE PAGE"

ORGANIZATION CONTACT: Name/Title
Telephone Number

PRINCIPAL PRODUCT: Description of type of components, equipment, or services supplied.

NUCLEAR INDUSTRY ACTIVITY: Brief statement of scope of activity including percentage of organization effort, if applicable.

ASSIGNED INSPECTOR: (Signature) _____ _____
Name/VPB Section Date

OTHER INSPECTOR(S): Name/VPB Section

APPROVED BY: (Signature) _____ _____
Name/VPB Section Date

INSPECTION BASES AND SCOPE:

A. BASES: Pertain to the inspection criteria that are applicable to the activity being inspected, i.e., 10 CFR Part 21, Appendix B, and SAR or Topical Report commitments.

B. SCOPE: Summarizes the specific QA program areas that were reviewed, and/or identifies plant systems, equipment or specific components that were inspected. For reactive (identified problem) inspections, the scope summarized the problem that caused the inspection to be performed.

PLANT SITE APPLICABILITY: Lists docket numbers of licensed facilities for which equipment, services or records were examined during the inspection.

ORGANIZATION: COMPANY, DIVISION
CITY, STATE

REPORT NO:	INSPECTION RESULTS:	Page 2 of 2

A. VIOLATIONS: Shown here are any inspection results determined to be in violation of Federal Regulations (such as 10 CFR Part 21) that are applicable to the organization being inspected.

B. NONCONFORMANCES: Shown here are any inspection results determined to be in nonconformance with applicable commitments to NRC requirements. In addition to identifying the applicable NRC requirements, the specific industry codes and standards, company QA Manual sections, or operating procedures which are used to implement these commitments may be referenced.

C. UNRESOLVED ITEMS: Shown here are inspection results about which more information is required in order to determine whether they are acceptable items or whether a Violation or Nonconformance may exist. Such items will be resolved during subsequent inspections.

D. STATUS OF PREVIOUS INSPECTION FINDINGS: This section is used to identify the status of previously identified Violations, items of Nonconformance and/or Unresolved Items until they are closed by appropriate action. For all such items, this section will indicate open/closed classification, identify the inspection report which first produced the item, describe the nature of the item, and if closed, include a brief statement concerning action which closed the item. If this section is omitted, all previous inspection findings have been closed.

E. OTHER FINDINGS OR COMMENTS: This section is used to provide significant information concerning the inspection areas identified under "Inspection Scope." Included are such items as mitigating circumstances concerning a Violation or Nonconformance, statements concerning the limitations or depth of inspection. (Sample Size, type of review performed) and special circumstances or concerns identified for possible follow up. For reactive inspections, this section will be used to summarize the disposition or status of the condition or event which caused the inspection to be performed.

SAMPLE PAGE
EXPLANATION OF FORMAT AND TERMINOLOGY

CONTRACTORS WITH NRC LETTERS CONFIRMING QA PROGRAM IMPLEMENTATION

(SEE NEXT PAGE FOR EXAMPLE OF CONFIRMING LETTERS)

CONTRACTOR	TOPICAL REPORT	REVISION	DATE OF NRC LETTER
BABCOCK & WILCOX	BAW 10096A	REVISION 1	DECEMBER 30, 1975
STONE & WEBSTER	SWSQAP 1-74	REVISION A	DECEMBER 30, 1975
WESTINGHOUSE NTD	WCAP-8370	REVISION 9A	APRIL 30, 1981
BECHTEL-GAITHERSBURG	BQ-TOP-1	REVISION 2A	MARCH 16, 1981
BECHTEL-SAN FRANCISCO	BQ-TOP-1	REVISION 3A	JUNE 12, 1981
EBASCO SERVICES, INC.	ETR-1001	REVISION 8A	MARCH 31, 1980
COMBUSTION ENGINEERING	CENPD-210-A	REVISION 3	JUNE 2. 1981
GIBBS & HILL, INC.	GIBSAR 17-A	AMENDMENT 2	MARCH 31, 1977
UNITED ENGINEERS & CONSTRUCTORS	UEC-TR-001-3A	AMENDMENT 5	MARCH 31, 1977
GENERAL ELECTRIC CO.	NEDO-11209-04A	N/A	MARCH 30, 1977
SARGENT & LUNDY ENGINEERS	SL-TR-1A	REVISION 5	MAY 17, 1979
BECHTEL-LOS ANGELES	GQ-TOP-1	REVISION 2A	JUNE 5, 1979
GILBERT-COMMONWEALTH	GAI-TR-106	REVISION 2A	FEBRUARY 2, 1981
BECHTEL-ANN ARBOR	BQ-TOP-1	REVISION 2A	MAY 7, 1981

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TEXAS 76012

(ADDRESSEE)

Gentlemen:

A series of Nuclear Regulatory Commission (NRC) inspections have been conducted to review your implementation of the Quality Assurance Program applicable to NRC applicants or licensees who have contracted for services from the (applicable corporate entity). These inspections consisted of selective examination of procedures and representative records, interview of personnel, and direct observation by the inspectors. As a result of these inspections, the NRC has concluded that the QA program described in Topical Report _____ is being implemented satisfactorily. Neither this conclusion nor the remainder of this letter applies to manufacturing activities or construction related activities conducted at reactor sites.

Licensees and applicants that have referenced the above Topical Report in their Safety Analysis Reports (or have adopted the total quality assurance program described in that Topical Report) may, at their option, use this letter to fulfill their obligation under 10 CFR Part 50, Appendix B, Criterion VII, that requires them to perform initial source evaluation/ selection audits and subsequent periodic audits to assess the quality assurance program implementation.

The NRC expression of satisfaction with the implementation of your QA program does not assure that a specific product or service offered by you to your customer is of acceptable quality, nor does it relieve the applicant or licensee from the general provision of Criterion VII which requires verification that purchased material, equipment, or services conform to the procurement documents. It is recognized that in some cases this assurance can be made by the applicant or licensee without audits or inspections at your facility.

Continuing acceptability of implementation of your QA program is contingent upon your maintaining a satisfactory level of program implementation, certified through periodic NRC inspection, throughout all corporate organization units and nuclear projects encompassed by your program. Should your program implementation at any time be found unacceptable you will be notified by letter and requested to correct the deficiencies promptly. In the

event you fail to correct the deficiencies promptly, or if the record of deficiencies is such as to indicate generally poor program implementation, you and the applicants and licensees who have referenced your QA program will be notified that the generic implementation of your program is no longer acceptable to the NRC. All of the audit/inspection requirements of Criterion VII, Appendix B, 10 CFR Part 50, must then be implemented by the applicants or licensees. The NRC will reinstate its letter of acceptability of implementation of your QA program only after our inspectors have concluded, based on reinspection, that you have again demonstrated full compliance.

Except as noted above, the conclusions expressed in this letter will be effective for three years from the date of issue of the letter. At that time, program performance over the previous three year period will be evaluated and this letter reissued, if appropriate.

The results of our inspection are published quarterly in the Licensee Contractor and Vendor Inspection Status Report (NUREG 0040), which is made available to NRC facility applicants, licensees, contractors, and vendors, as well as to members of the public, by subscription.

Sincerely,

Regional Administrator

ORGANIZATION: ANCHOR DARLING VALVE COMPANY
WILLIAMSPORT, PENNSYLVANIA

REPORT NO.: 99900053/82-01	INSPECTION DATE(S) 2/23-26/82	INSPECTION ON-SITE HOURS: 23

CORRESPONDENCE ADDRESS: Anchor Darling Valve Company
ATTN: Mr. J. W. Marlatt
General Manager
701 First Street
Williamsport, PA 17701

ORGANIZATIONAL CONTACT: Mr. G. W. Kneiser, Quality Assurance Manager
TELEPHONE NUMBER: (717) 323-6121

PRINCIPAL PRODUCT: ASME Section III Class 1, 2, and 3 valves.

NUCLEAR INDUSTRY ACTIVITY: Anchor Darling Valve Company's contribution to the nuclear industry represents approximately 70 percent of its total work load.

ASSIGNED INSPECTOR: Wm. D. Kelley 4/5/82
Wm. D. Kelley, Reactive & Component Program Section (R&CPS) Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes 4/5/82
I. Barnes, Chief, R&CPS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21 and 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made as a result of the issuance of: (1) a construction deficiency report by Mississippi Power and Light Company concerning the premature opening of torque switches on valves installed at the Grand Gulf Nuclear Plant which resulted from engagement by excessively threaded stem protectors with the stem lock nuts; and (2) a potential 10 CFR Part 21 report by Pennsylvania Power and Light Company (PP&LC) concerning cavitation
(cont. on next page)

PLANT SITE APPLICABILITY:

50-387, 50-416

ORGANIZATION: ANCHOR DARLING VALVE COMPANY
WILLIAMSPORT, PENNSYLVANIA

REPORT NO.: 99900053/82-01	INSPECTION RESULTS:	PAGE 2 of 4

SCOPE: (Cont.) and/or difficulty in the throttling of valves F017A and B within the ranges specified in the PP&LC Technical Specification for the start-up testing of the Susquehanna Steam Electric Station's Residual Heat Removal System. Additional areas selected for inspection included design and document control, and status of previous inspection findings.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Unresolved Item (81-01) - The inspector verified by review of the manufacturing drawings for the original valves installed in the Southern California Edison Company's San Onofre Nuclear Generating Station that the stacked tolerances were controlled during manufacturing and assembly but were not in accordance with the clearances specified in the ADVC Design/Drafting Standard for quick closing valves. The valves installed in the San Onofre Nuclear Generating Station were modified at the licensee's request to increase the closing speed and the ADVC standard was not developed until subsequent to this modification.

2. (Closed) Nonconformance (81-01) - Two gate valves on Order No. 1024-001-001 for Washington Public Power Supply System Nuclear Project 2 were shipped with the by-pass installed on the opposite side of the valves.

   The inspector verified that the ADVC quality assurance program now requires separate travelers for valves that are identical with the exception of the by-pass.

3. (Open) Nonconformance (81-01) - An equation for a circular plate with inner edge fixed and supported and uniform loading along the outer edge was improperly used for analysis of a flange.

   This item was not reviewed during this inspection as a result of corrective action correspondence being incomplete.

ORGANIZATION: ANCHOR DARLING VALVE COMPANY
WILLIAMSPORT, PENNSYLVANIA

REPORT NO.: 99900053/82-01	INSPECTION RESULTS:	PAGE 3 of 4

E. OTHER FINDINGS OR COMMENTS:

1. 10 CFR Part 21 Report by Pennsylvania Power and Light Company (PP&LC) - Problem reported was cavitation and/or difficulty in the throttling of valves F017A and B within the ranges specified in the PP&LC Technical Specifications for the start up testing of the Susquehanna Steam Electric Station's Residual Heat Removal System.

   Valves F017A and B were purchased from ADVC by Bechtel Power Corporation (BPC) on their purchase orders 8856P-10-A and 8856-12-A, dated December 26, 1973. The flow requirement for the valves was specified in the Valve Data Sheets which were attached to the BPC valve specifications 8856P-10 & 12; however, the specifications did not require flow tests be performed on the valves. ADVC's selection of their valves to meet the required flow rates was based on their calculated C_v factors.

   BPC's letter to ADVC dated May 6, 1981, listed the throttled flow condition for six valves during plant start-up and the duration (hours/year) of the throttled conditions. These throttled flows were not specified in the original purchase documents. ADVC evaluated the new flow conditions and advised BPC that two of the valves (Item 9.9 on purchase order number 8856P-12-A and item 7.11 on purchase order number 8856P-10-A) would require modification of the discs. Subsequently, BPC issued Revision 24, dated November 11, 1981, to purchase order number 8856-10-A and Revision 29, dated December 4, 1980, to purchase order number 8856-12-A purchasing replacement throttling discs for the valves.

2. Potential Construction Deficiency Report by Mississippi Power and Light Company (MP&LC) - Problem reported was the excessive threads on the valve stem protectors permitted the protectors to come in contact with the valve operator stem lock nut of the valves installed at the Grand Gulf Nuclear Plant, causing the valve operator opening torque switches to trip prematurely.

   The Potential Construction Deficiency Report made by MP&LC to NRC Region II on March 3, 1980, identified two manufacturers whose stem protectors came in contact with the valve operator stem lock nuts, but did not identify the valves or the size and type of the Limitorque Corp. (LC) valve operators.

ORGANIZATION: ANCHOR DARLING VALVE COMPANY
WILLIAMSPORT, PENNSYLVANIA

REPORT NO.: 99900053/82-01	INSPECTION RESULTS:	PAGE 4 of 4

The NRC inspector verified by visual observation of the LC valve operators (Models SMB-0, SMB-00, SMB-000, SMB-1, and SMB-2) and the LC catalog, that the valve operators had a thread run-out approximately 3/8 inch deep and a shoulder at the bottom of the run-out which would have prevented the pipe nipple or pipe plug (used as a stem thread protector or closure) from engaging the stem lock nut of the valve operators. The LC valve operator Model SMB-3 has a 1½ inch space from the bottom pipe thread to the lock nut. This would mean that the pipe nipple used as a stem protector would have to have a running pipe thread in excess of 1½ inches in length to engage the lock nut. All of the LC valve operators inspected had their hand wheels mounted on the side of the operators, and there were no LC SMB-000 valve operators with the hand wheel mounted on the top of the operator available for inspection.

3. Design and Document Control - Reviewed one section of the quality assurance manual, eight engineering standards, two customer specifications, one customer purchase order, one master valve list, one material drawing list, one shop order instruction, one engineering data sheet, two valve assembly drawings, one design report, one design/drafting standard, and one flange design project. Verified procedures had been implemented to control review and approval of design calculations.

ORGANIZATION: BABCOCK AND WILCOX COMPANY
NUCLEAR POWER GENERATION DIVISION
LYNCHBURG, VIRGINIA

REPORT NO.: 99900400/82-01	INSPECTION DATE(S) 1/26-28/82	INSPECTION ON-SITE HOURS: 42

CORRESPONDENCE ADDRESS: The Babcock and Wilcox Company
Nuclear Power Generation Division
ATTN: Mr. D. E. Guilbert, Vice Pres. & Gen. Mgr.
P. O. Box 1260
Lynchburg, VA 24505

ORGANIZATIONAL CONTACT: Mr. E. L. Davis, QA Manager
TELEPHONE NUMBER: (804) 385-2895

PRINCIPAL PRODUCT: Nuclear Steam Supply Systems, engineering services and operating plant support.

NUCLEAR INDUSTRY ACTIVITY: The total effort committed to domestic nuclear activities is approximately 88% of the 1,300 employees of the Nuclear Power Generation Division. Principal activities include the design and procurement of nine projects; Bellefonte, Midland, Washington Public Power Supply System, North Anna, and Pebble Springs, and providing engineering services under 129 service contracts and 38 fuel reload contracts.

ASSIGNED INSPECTOR: for Wedi Potapovs 4-1-82
D. F. Fox, Reactor Systems Section (RSS) Date

OTHER INSPECTOR(S): W. D. Kelley, Reactive & Component Program Section

APPROVED BY: for Wedi Potapovs 4-1-82
C. J. Hale, Chief, RSS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B, Topical Report BAW-10096A and the PSAR for the Virginia Electric Power Company's North Anna 3 station.

B. SCOPE: This inspection was made as a result of: (1) a Babcock & Wilcox Company (B&W) 10 CFR Part 21 report that flow control valves, used in reactor coolant makeup and purification systems, were furnished to the Washington Public Power Supply System (WNP 1/4) and to the Portland General Electric Company (Pebble Springs) without provisions for assuring that the flow
(Cont. on next page)

PLANT SITE APPLICABILITY: Documentation/records identified with the following nuclear facilities were examined during this inspection: Washington Public Power Supply System, Units 1 and 4, 50-460/513; Portland General Electric Company, Pebble Springs, 50-514/515; Virginia Electric Power Company, North Anna 3, 50-404.

ORGANIZATION: BABCOCK AND WILCOX COMPANY
NUCLEAR POWER GENERATION DIVISION
LYNCHBURG, VIRGINIA

REPORT NO.: 99900400/82-01	INSPECTION RESULTS:	PAGE 2 of 7

SCOPE: (Cont.) through the valves in their closed position meets minimum flow requirements; (2) a Virginia Electric Power Company (VEPCO) 10 CFR Part 21/10 CFR Part 50.55(e) report that apparent disparities between the B&W analytical model of the VEPCO North Anna 3 steam generator upper support system and the actual hardware design yielded loading data which could result in potentially nonconservative results when used by Stone and Webster to design the supporting steel and concrete structures; (3) validation of computer codes; and (4) status of previous inspection findings.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

1. Certain structural analyses may not meet regulatory requirements in that they do not appear to be sufficiently detailed with respect to assumptions, bases, source of inputs, reference to the hardware design drawings, analytical model-to-hardware relationship, and interpretation of results. This item will be further evaluated during a future inspection.

2. Procurement controls for flow control valves do not appear to comply with QA program commitments, in that valves were furnished that were not designed to provide the required minimum flow of two gallons per minute in the closed position at a pressure differential of 820 pounds per square inch, and which B&W-NPGD source surveillance and vendor drawing review failed to detect. This item will be further evaluated during a future inspection in regard to additional information that has been stated by B&W to be available for review at NPGD.

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

(Open) Unresolved Item (81-02): The recently appointed QA Manager does not appear to possess the minimum qualifications, for the position, that are delineated in the NRC approved revision of the B&W Topical Report.

B&W Topical Report BAW-10096 was revised (to draft rev. 4) and submitted to NRC headquarters for review and approval. Resolution of this item was deferred pending NRC action on the proposed revision.

ORGANIZATION: BABCOCK AND WILCOX COMPANY
NUCLEAR POWER GENERATION DIVISION
LYNCHBURG, VIRGINIA

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E. OTHER FINDINGS OR COMMENTS:

1. Design Inspection (Validation of Computer Codes) - The B&W Topical Report (BAW-10096A), the NPGD (Nuclear) Quality Assurance Manual (19A-N.1) and implementing engineering and administrative procedures were reviewed to determine the commitments and requirements relative to control of analog and digital computer codes used in the design or analysis of safety related structures, systems and components.

   Program (user's) manuals, code certification data and records, code usage and Control Data Corporation (CDC) 7600 central processing unit (CPU) run time data, technical Topical Reports, and other documentation related to: (1) versions 13.0 and 15.0 of STALUM (a digital computer code used for the static and dynamic three-dimensional structural analyses of piping or structural support systems by a finite element method, all current versions of which were run approximately 4,200 times last year for a total of 118 CPU hours); (2) versions 13 and 17 of CRAFT 2 (a digital computer code used for the simulation and transient analysis of the transient multinode flows and momentums of a reactor plant during a loss of coolant accident, all current versions of which were run approximately 1,300 times last year for a total of 118 CPU hours); and (3) versions 7.4 and 8.4 of PDQ07 (a digital computer code used to solve the reactor core neutron flux diffusion - depletion equations in three dimensions for up to five neutron energy groups, all current versions of which were run approximately 4,500 times last year for a total of 223 CPU hours).

   The inspector noted that Revisions N and Q of the program manual for the STALUM computer code (NPGD-TM-376) were not revised in accordance with procedure NPGD-0903-03 in that the Technology Unit Manager responsible for reviewing the revised program manual did not sign in the appropriate block on the Title Page to attest that he reviewed the revised program manual for content and correctness as required. Furthermore, the signature of the Technology Unit Manager on the Title Page of both revisions corresponded to an individual who terminated his employement at NPGD approximately one year before the revisions were issued.

With respect to this item; i.e., reviewing and approving program manuals, two of the three organization units responsible for generating program manuals did comply with procedure NPG-0903-03 in that the Technology Unit Manager responsible for reviewing the revised program manual did sign in the appropriate block on the Title Page of the revised manual.

With respect to the actual methodology of verifying and certifying computer codes, and revisions thereto, the inspector noted the B&W engineering judgment that "the output of the calculation is reasonable compared to the input" even though documented, may not, depending on the test run, be a sufficient basis for certifying that the code will execute and produce results as described in the program manual for problems which more fully exercise the Code and the computer's temporary and permanent read/write data storage media.

This area will be inspected further during subsequent inspections.

2. 10 CFR Part 21/10 CFR Part 50.55(e) - This inspection was to determine the cause, significance, and design corrective action taken by B&W with respect to VEPCO 10 CFR Part 21/10 CFR Part 50.55(e) report that apparent disparities exist between the B&W analytical model, and the actual hardware design, of the upper supports for the VEPCO North Anna 3 (NA-3) steam generators (SGs). The reported safety concern was that the loadings on the supports under LOCA and other accident conditions that were calculated by B&W were nonconservative and could potentially yield nonconservative results when used by Stone and Webster (S&W) to design the embedment structures for the SG supports.

Review of available documentation and interviews with cognizant personnel indicate that B&W did calculate loading data, and transmitted it to S&W via Specification 18-1235000017-09 dated November 8, 1978. The specification contained incongruent and nonconservative local maximum loading data with respect to upper SG support points 4 through 8 of the NA-3 SGs. Specifically, (1) alternating loads (compressive and tensile loads in the Z-axis direction) were identified as being applied to SG upper support point 4 under accident conditions when the physical design of the support could not restrain tensile loads, and (2) the alternating loads (with respect to the Z-axis direction) that were identified as being applied to SG upper support points 5 through 8 were each only about one-half of what they should have been.

ORGANIZATION: BABCOCK AND WILCOX COMPANY
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The incongruent and nonconservative local loading data apparently resulted from calculations made prior to November, 1978, which deployed an analytical model and structural analysis computer code (STALUM) with limited capabilities (i.e., STALUM could not accommodate boundary conditions (restraint points) that were not bidirectional), and assumptions made by the analyst with respect to the mechanism for transmitting loads on the SG upper supports to their embedment structures. Although not well documented in the calculations, it appears that the analyst assumed that any load in the ± Z-axis direction applied to either SG trunnion support beam was transmitted to the concrete embedment for each beam equally through the friction connections provided by pretensioned bolting at each end of each beam rather than totally to the appropriate shear plate povided at each end of each beam.

S&W requested B&W on November 4, 1980, to advise them whether the disparity between the mathematical model and the hardware design may have affected any data that had been transmitted to them. B&W concluded that the data were affected by the disparity, and during a series of meetings and discussions held with S&W from October, 1980, through October, 1981, both S&W and B&W agreed that: (1) the loads applied at point 4 were not reported properly; and (2) the assumption that the loads applied to the concrete embedments through friction connections provided by pretensioned bolting was not viable due to bolt stress corrosion cracking concerns and the need for performing otherwise nonscheduled routine inspection and maintenance to assure adequate bolting pretension during plant operation.

B&W agreed to recalculate the loadings on the upper SG supports, and all other NSSS system component supports, where pretensioned bolting was assumed to provide friction connections for load transference to the support embedments. The new calculations were also to include the effects of recently revised seismic response spectra, containment radial pressure pulse transient loadings, and other upgraded/revised loadings and displacements on NSSS components during accident conditions. The calculations are being redone on a priority basis established by S&W sketch 81 ENG 6-1 dated November 30, 1981, and are being reported, as completed, via revisions to document 86-1127658. All calculations are scheduled for completion by January 17, 1983. B&W engineering stated that they planned to revise specification 18-1235000017 (Reactor Coolant System Foundation and Nozzle loadings) shortly thereafter.

The safety significance of this design/analysis deficiency could not be established at B&W since the detailed design and the load bearing capabilities of the shear plates could only be ascertained at S&W. However, since the data is being revised/upgraded prior to the final design and construction of the concrete embedments (as stated by B&W), there should be no impact on plant safety with respect to this item.

One unresolved item was identified in this area of the inspection (see C.1 above).

3. Flow Control Valves in the Makeup and Purification System - B&W-NPGD notified the Nuclear Regulatory Commission (NRC) by letter dated January 9, 1981, of the failure of the 2½ x 2½" 1,500 pound globe valves to meet the two gallon per minute flow requirement at a pressure differential of 820 pounds per square inch when the valves were in the closed position as specified in the B&W-NPGD Design Specification 08-1148000002-05. These valves were supplied to Washington Public Power Supply System (WPPSS), Nuclear Projects Units 1 and 4 and Portland General Electric (PGE), Pebble Springs Nuclear Plant for use as makeup flow control valves in the makeup and purification systems. B&W-NPGD notified WPPSS and PGE of the defiency and initiated a program to determine a method of providing the required flow when the valves are in the closed position.

The valves for each project are identified as B&W Mark Number MU-V46.

An NRC inspection was performed at B&W Control Components Incorporated (B&W-CCI), Irvine, California, on June 22-24, 1981, to ascertain the cause of the failure of the valves to provide a two gallon per minute flow rate at a pressure differential of 820 pounds per square inch in the valve closed position. As a result of this inspection (see NRC Report 99900262/81-01), an NRC:RIV decision was made to follow up on the reported deficiency at B&W-NPGD.

ORGANIZATION: BABCOCK AND WILCOX COMPANY
NUCLEAR POWER GENERATION DIVISION
LYNCHBURG, VIRGINIA

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During this inspection the NRC inspector reviewed the B&W-NPGD Quality Assurance Manual, two change orders to two B&W-NPGD purchase orders, two change order acknowledgments (B&W Form BWNP-20089(1-76)), two inspection forms, one B&W-CCI test procedure, and one B&W-CCI drawing. It was verified that: (1) B&W-NPGD had notified B&W-CCI, by change notices to their purchase orders, of the two gallon per minute flow requirement at a pressure differential of 820 pounds per square inch when the valves were in the closed position; and (2) B&W-CCI had acknowledged the change notices to the purchase orders that specified the flow requirement with the valves in the closed position.

With respect to the two gallon per minute minimum flow requirement, the NRC inspector identified that: (1) flow tests had not been required by the B&W-NPGD Equipment Specification to assure compliance with the requirements; (2) source surveillance activity failed to detect that no provisions had been made by B&W-CCI in the valve design for compliance with this minimum flow requirement; (3) the B&W-CCI test procedure did not include a flow test to demonstrate compliance; (4) B&W-CCI drawing 920706018 was approved by B&W-NPGD, although it did not include this flow requirement; and (5) the valve deficiency had not been documented as a nonconformance and corrective action had not been documented or implemented to preclude recurrence.

B&W personnel stated at the exit meeting, that additional information was available on this subject that the NRC inspector did not have the opportunity to review. This item is considered unresolved pending review of this additional information.

ORGANIZATION: BECHTEL POWER CORPORATION
GAITHERSBURG POWER DIVISION
GAITHERSBURG, MARYLAND

REPORT NO.: 99900519/82-01	INSPECTION DATE(S) 1/25-29/82 2/22-26/82	INSPECTION ON-SITE HOURS: 63

CORRESPONDENCE ADDRESS: Bechtel Power Corporation
Gaithersburg Power Division
ATTN: Mr. J. M. Komes, Vice President and
General Manager
15740 Shady Grove Road
Gaithersburg, MD 20760
ORGANIZATIONAL CONTACT: Mr. D. C. Kansal, QA Manager
TELEPHONE NUMBER: (301) 258-3776

PRINCIPAL PRODUCT: Architect Engineering Services

NUCLEAR INDUSTRY ACTIVITY: The Gaithersburg Power Division has a total of 2,755 employees of which 2,017 or 73% are assigned to nuclear projects. Major projects include Callaway Unit 1, Wolf Creek Unit 1, and Grand Gulf Units 1 and 2. There are also modification/repair/service contracts on 14 additional reactor units.

ASSIGNED INSPECTOR: J. R. Costello
J. R. Costello, Reactor Systems Section (RSS) 4/2/82 Date

OTHER INSPECTOR(S): W. P. Ang, Region II

APPROVED BY: for R. H. Bachley
C. J. Hale, Chief, RSS 4/2/82 Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B, and SNUPPS PSAR, Chapter 17

B. SCOPE: Implementation inspection of Bechtel's commitments in the areas of compliance with NRC IE Bulletins 79-14 and 79-02, design corrective action, and a 10 CFR Part 50.55(e) report and a potential construction deficiency report which covered the following: (1) valve chatter in RHR heat exchanger vent valves (Grand Gulf 1 and 2); and (2) incorrect sized cable which resulted in a failure of the control rods to scram (Grand Gulf 1 and 2).

PLANT SITE APPLICABILITY:

The contents of this report relate to the following dockets: 50-416, 50-482, 50-483, 50-321, 50-366, 50-250, 50-251, 50-348, and 50-364.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Design Corrective Action - SNUPPS PSAR Chapter 17, Engineering Department and Engineering Project Procedures were examined to determine quality assurance program commitments. To verify implementation of these commitments, the following documents were examined: QA program management corrective action log, project open items list, three management corrective action reports, five open items, six nonconformance reports (NCRs), four deficiency/noncompliance reports, three revised drawings, and three revised calculations. Relative to the documents examined, all quality assurance program commitments were being properly implemented.

2. Potential Construction Deficiency Report - Valve chatter in RHR Heat Exchanger Vent Valves (Grand Gulf).

   Mississippi Power and Light Company (MP&L) reported to Region II that the RHR heat exchanger vent valves, manufactured by Yarway, open and close intermittently due to a worm gear in the valve operator which is not self-locking. The purpose of this inspection was to determine if this was a generic problem, and if there was a breakdown in the AE's quality program.

   The problem was discovered by Bechtel during testing operations at the construction site prior to turnover to MP&L and was, therefore, not reportable under 10 CFR Part 21, but was reportable under 10 CFR Part 50.55(e).

   The problem was corrected by rewiring the control circuit to actuate the position switch which opens at full close or full travel of the valve and thus prevents reenergizing the circuit. This position switch is in the switch compartment furnished with the Limitorque actuator and is available for customer use, if necessary. Normally,

the Limitorque valve actuator has a self-locking capability and it is not necessary to use the position switch lockout. However, in a few cases it is not possible to achieve self-locking capability and at the same time satisfy specification requirements of quick close operation at reduced voltage and high differential pressure. This is what happened at Grand Gulf and affected 20 valve actuators out of a total of approximately 160. The condition is difficult to predict prior to final test operation, but can be corrected by rewiring the control circuit on those valve actuators to achieve the self-locking capability.

No similar problems were found in other nuclear plants being designed by Bechtel/Gaithersburg. However, a management information bulletin was sent out to other Bechtel offices to alert them of the problem.

The potential error in this case appears to be a failure of the valve supplier to alert the user that this condition could occur and could be corrected by rewiring the control circuit.

All modifications have been completed on Unit 1. Unit 2 modifications will be completed prior to Unit 2 fuel load.

No nonconformances or unresolved items were identified in this area of the inspection.

3. Potential Construction Deficiency - Incorrect Sized Cable Resulting in Failure of the Control Rods to Scram

On August 26, 1981, Mississippi Power & Light Company notified Region II that during control rod testing, 14 scram pilot valves were found stuck in the energized state when both of the solenoids were deenergized. The purpose of this inspection was to determine if this was a generic problem and if there was a breakdown in the AE's quality program.

The valves that failed did not contain a defect. They were damaged by being operated with insufficient voltage being supplied to the solenoid coils by the Reactor Protection System (RPS) due to cables of insufficient capacity. The low voltage caused chattering of the solenoid core internals, resulting in damage and subsequent sticking of the internals, preventing proper operation.

G.E. Specification 22A3899AE CRD Hydraulic Control System, Section 4.3, states that the minimum pick up voltage for the pilot scram valves is 87 VAC. Bechtel calculations showed the minimum voltage across the most remote solenoid valve to be 96 VAC with the original sized wiring.

After the problem had been discovered, information supplied by the solenoid manufacturer indicated their solenoids would not operate properly below 105 VAC and that they had been purchased to operate between 105 and 125 VAC

The affected Reactor Protection System Supply Cables are being replaced with cables of sufficient capacity and all scram pilot valves are being rebuilt to replace damaged parts.

Two Nuclear projects at Bechtel/Gaithersburg use GE nuclear steam supply systems. This problem was identified as being unique to the Grand Gulf project and did not affect the Hatch project.

The error appears to be in the GE/Bechtel interface whereby the information supplied by the solenoid manufacturer of a minimum requirement of 105 VAC for proper operation was not transmitted in GE documentation to Bechtel.

A Problem Alert was issued by Bechtel/Gaithersburg to other Bechtel offices on January 6, 1982. This problem alert warned of the danger of low voltage with this type solenoid.

No nonconformances or unresolved items were identified in this inspection. However, in future inspections the NSSS/AE interface requirements will be examined in greater detail.

4. Follow up on IE Bulletins 79-14 and 79-02 - This was a follow-up inspection related to activities performed at the Gaithersburg office of Bechtel Power Corporation which resulted from the issuance of IE Bulletin 79-14 (Seismic Analysis for As-Built Safety Related Piping Systems) and IE Bulletin 79-02 (Pipe Support Base Plate Designs Using Concrete Expansion Anchor Bolts). The inspection was performed by an inspector from Region II with limited participation from the Region IV inspector. There were no findings regarding the programmatic aspects of Bechtel's efforts. The other aspects of this inspection will be reported in Region II Reports 50-416/82-06; 50-321/82-03; 50-366/82-03; 50-348/82-07; 50-364/82-06; 50-250/82-12; and 50-251/82-12. The highlights of these inspections are as follows:

   a. Grand Gulf, Unit 1, Report No. 50-416/82-06 - To verify implementation of the requirements of IEB 79-02 and 79-14, six stress problems and six baseplate design calculations with their related documents were examined. Also, the as-built configuration for two pipe anchors was checked. One unresolved item was

identified to the licensee. There were no violations or deviations. The unresolved item concerned IEB 79-02 and 79-14 analytical discrepancies of which six were identified.

b. Hatch, Units 1 and 2, Report Nos. 50-321/82-03 and 50-366/82-03 - To verify implementation of the requirements IEB 79-02 and 79-14, three Licensee Event Reports, seven drawings and one letter were examined. One unresolved item was identified to the licensee. There were no violations or deviations. The unresolved item concerned three unresolved discrepancies involving IEB 79-02 and 79-14.

c. Joseph M. Farley, Units 1 and 2, Report Nos. 50-348/82-07 and 50-364/82-06 - To verify implementation of the requirements of IEB 79-02 and 79-14, one schematic drawing, one isometric drawing, and one stress problem with their related documentation were examined. No violations, deviations or unresolved items were identified in the IE 79-02 and 79-14 area. However, one unresolved item was identified to the licensee concerning the nonsafety-related classification of the diesel generator exhaust piping and pipe supports.

d. Turkey Point, Units 3 and 4, Report Nos. 50-250/82-12 and 50-251/82-12 - To verify implementation of the requirements of IEB 79-02 and 79-14, two stress problems with their related documentation were examined. One unresolved item concerning two discrepancies involving IEB 79-14 was identified to the licensee. Also, another unrelated unresolved item was identified to the licensee concerning the nonsafety-related classification of the diesel generator exhaust piping and pipe supports. No violations or deviations were identified.

ORGANIZATION: BECHTEL POWER CORPORATION
LOS ANGELES POWER DIVISION
NORWALK, CALIFORNIA

REPORT NO.: 99900521/82-01	INSPECTION DATE(S) 3/8-12/82 & 3/22-26/82	INSPECTION ON-SITE HOURS: 64

CORRESPONDENCE ADDRESS: Bechtel Power Corporation
Los Angeles Power Division
ATTN: Mr. J. V. Morowski
Vice President and General Manager
P. O. Box 60600, Terminal Annex
Los Angeles, CA 90060

ORGANIZATIONAL CONTACT: Mr. R. L. Patterson, QA Manager
TELEPHONE NUMBER: (213) 864-6011, Ext. 2061

PRINCIPAL PRODUCT: Architect Engineering Services

NUCLEAR INDUSTRY ACTIVITY: The Los Angeles Power Division of the Bechtel Power Corporation is the architect engineer for nine domestic reactor units. Fifty percent of the total personnel (approximately 7,700) are assigned to activities in connection with these units. At the present time, the Houston Area office has a staff of 457.

ASSIGNED INSPECTOR: J. R. Costello, Reactor Systems Section (RSS) Date 5/24/82

OTHER INSPECTOR(S):

APPROVED BY: C. J. Hale, Chief, RSS Date 5/25/82

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B, and Topical Report No. BQ-TOP-1

B. SCOPE: The inspection conducted at Bechtel's Norwalk and Houston facilities was to assess the effectiveness of Bechtel's program for conducting audits and training, to check on the status of previous inspection findings, and to evaluate the quality program implications of two items reported per 10 CFR Part 50.55(e) and 10 CFR Part 21.
(Cont. on next page)

PLANT SITE APPLICABILITY: The contents of this report relate to the following dockets: 50-361, 50-362, 50-424, 50-425, 50-498, 50-499, 50-528, 50-530.

ORGANIZATION: BECHTEL POWER CORPORATION
LOS ANGELES POWER DIVISION
NORWALK, CALIFORNIA

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SCOPE: (Cont.)

One item concerned the design of the primary loop crossover leg pipe restraint (Alvin W. Vogtle 1 & 2) and the other the omission of locking devices on fasteners of certain mechanical shock arrestors (San Onofre 2 & 3).

A. VIOLATIONS:

None.

B. NONCONFORMANCES:

1. Contrary to Criterion V of 10 CFR Part 50, Appendix B and Quality Assurance Department Procedure (QADP) 5.3, no department/project/construction managers or their designees attended the pre and post-audit conferences for the management audit of SONGS 2 and 3 engineering office. Also, no department/project/construction manager or their designees attended the pre-audit conference for the management audit of the Vogtle design office.

2. Contrary to Criterion V of 10 CFR Part 50, Appendix B and QADP 5.3, the response to CAR-002 of the management audit of the Vogtle Design Office was 11 days beyond the 30-day requirement and no scheduled date for response had been established. Further the management audit of division engineering had scheduled corrective action for CAR-001 by March 20, 1981, however, this item is still open almost a year later. CAR-001 required the establishment and documenting of a system that would provide for implementing quality requirements consistent with ANSI N45.2 in engineering initiated technical service agreements and consultant agreements.

3. Contrary to Criterion V of 10 CFR Part 50, Appendix B and QADP 5.1, the Vogtle Audit Activity Report for January and February 1982 did not identify the personnel contacted during the pre-audit, audit, and post-audit activities.

4. Contrary to Criterion V of 10 CFR Part 50, Appendix B and Palo Verde Quality Program Procedure No. 18.0, Palo Verde Project Audit Reports PVH 5/18-29, PVH 7/81-16 and PVH5/81-9 did not include persons contacted during pre-audit, audit and post-audit activities.

   No written response is required to this nonconformance as corrective action was taken prior to the close of the inspection. Palo Verde Quality Program Procedure No. 18.0 was revised to require only the names and titles of persons contacted during the audit activities.

C. UNRESOLVED ITEMS:

1. It is not apparent that there is an effective means of revision control for the Quality Assurance Training Manual (which is a controlled document). The inspector could not be certain the procedures in the manual were the latest procedures since the Table of Contents did not reference revisions.

2. It is not apparent that the present method of verifying indoctrination and training of Quality Assurance Engineers and project personnel is adequate. The practice of using signatures, initials, and dates in the training records to show completion of indoctrination and training does not provide a measure of comprehension of the subject matter. Comprehension for NDE personnel, for example, is provided by written examination and is documented.

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

(Closed) Nonconformance (81-02): Contrary to Criterion III of 10 CFR Part 50, Appendix B, and Appendix 17A of the Alvin W. Vogtle Nuclear Power Plant (VNP) PSAR, Bechtel had revised Section 17

of the VNP Project Reference Manual to allow Georgia Power Company field operations to make changes to approved engineering drawings, specifications, or other design documents without prior Bechtel Project Engineering approval.

Georgia Power Company requested and obtained approval from NRR to change their Quality Program commitments which will allow them to make field changes to approved drawings, specifications, or other design documents without prior design approval from Bechtel. This action legitimizes the actions taken by Bechtel in the above nonconformance. The inspector has been informed by the Georgia Power Company (GPC) Project QA Manager that documents have been placed in the SAR file confirming this change. The inspector has also been informed that special procedures have been instituted by GPC to control this type of field change which requires an after the fact review of the change by Bechtel.

E. OTHER FINDINGS OR COMMENTS:

1. Audits - Applicable quality assurance and project procedures were examined to determine quality assurance program commitments. To verify implementation of these commitments, the following documents were examined: one management audit report, four management quality assurance master audit plans, three quality assurance project audit reports, five quality assurance audit reports, and two audit activity reports. Relative to the documents examined, the nonconformances in B above were identified.

2. Training - Section 2 of the South Texas Project Quality Program Manual, Section 1.3 of the Bechtel Procurement Supplier Quality Manual, and applicable quality assurance and engineering procedures were examined to establish quality assurance program commitments. To verify implementation of these commitments, the following documents were examined: quality training manual, seven training records of quality assurance engineers, five project quality program indoctrination and training courses, and three certifications of Supplier Quality Representatives. Relative to the documents examined two unresolved items were identified (see C.1 and C.2. above).

ORGANIZATION: BECHTEL POWER CORPORATION
LOS ANGELES POWER DIVISION
NORWALK, CALIFORNIA

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A matter of concern was identified which pertains to the requirement of EDP 5.34, which states, "The Project Engineer shall be responsible for the formulation of the indoctrination and training program." At the present time, the South Texas Project has a Project Engineering Manager and three Project Engineers. The Systems, NSSS, Licensing, and QA Project Engineer have been responsible for the Phase A indoctrination and training program, but the present project procedures do not clearly specify this responsibility. The training program for Phase B has not yet been fully conceptualized and the inspector is concerned that this responsibility be identified, particularly if more than one project engineer should be involved.

3. 10 CFR Part 21 (Vogtle) - This design deficiency was reported by Bechtel to Region IV. The deficiency was discovered as a result of a request from GPC Construction to relax alignment and contact bearing requirements, resulting in a review of the crossover leg restraint design calculation. During the course of this review, a deficiency was identified in the assumptions used in modeling the transfer of loads from the crossover leg restraint to the slab and containment basemat.

   A recheck of the original engineer's work in seven other calculations resulted in two more designs being corrected. The original designs had been design verified and the fault would have to be traced to the assumptions of the original engineer, and the fact that the design reviewer accepted these assumptions as reasonable.

   Corrective action was taken by adding stiffener plates, splice plates, modifying bolt material, and changing bolt dimensions to exclude bolt threads from shear planes.

   A review of the remaining NSSS restraint and support designs did not show any additional deficiencies. This design is considered unique to the Vogtle project, but other Bechtel divisions were notified of this problem.

   No nonconformances or unresolved items concerning quality program commitments were identified.

ORGANIZATION: BECHTEL POWER CORPORATION,
LOS ANGELES POWER DIVISION
NORWALK, CALIFORNIA

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4. Deficiency Report 10 CFR Part 50.55(e) and 10 CFR Part 21 (San Onofre) - This deficiency was originally reported as a 10 CFR Part 50.55(e) by Southern California Edison and was later reported as a 10 CFR Part 21 by Bechtel.

   The problem was first identified by a Bechtel Supplier Quality Representative on a surveillance inspection of ITT-Grinnel. The supplier had failed to install hardened washers under the bolt heads in violation of the ASME code. During a field survey to determine the extent of the use of soft washers in ITT-Grinnel mechanical shock arrestors, it was determined that fasteners on some Pacific Scientific supplied mechanical shock arrestors had been installed without washers or any locking device in violation of code requirements.

   During the review of this problem it was found that a field change request to Construction Specification CS-P207 was issued, and incorrectly approved, to allow field installation of both ITT-Grinnell and Pacific Scientific snubbers without washers.

   The problem has been corrected at San Onofre and a bulletin has been issued to other Bechtel divisions advising them of this problem.

   No nonconformances or unresolved items were identified concerning quality program commitments.

ORGANIZATION: BECHTEL POWER CORPORATION
SAN FRANCISCO POWER DIVISION
SAN FRANCISCO, CALIFORNIA

REPORT NO.: 99900522/82-01	INSPECTION DATE(S) 4/19-23/82	INSPECTION ON-SITE HOURS: 32

CORRESPONDENCE ADDRESS: Bechtel Power Corporation
San Francisco Power Division
ATTN: Mr. C. D. Statton, V. Pres. and Gen. Mgr.
P. O. Box 3965
San Francisco, CA 94119

ORGANIZATIONAL CONTACT: Mr. C. W. Dick, QA Manager
TELEPHONE NUMBER: (415) 768-0790

PRINCIPAL PRODUCT: Architect Engineering Services

NUCLEAR INDUSTRY ACTIVITY: The total effort committed to domestic nuclear activities is approximately 92% of the 6700-person staff of the San Francisco Power Division. The division currently provides the principal architect engineering services for five domestic units: Limerick 1 and 2; Susquehanna 1 and 2; and Hope Creek 1; has project management for completion of Diablo Canyon 1 and 2; has 12 units under a modification/repair/service-type contract plus an engineering evaluation contract with an NSSS supplier.

ASSIGNED INSPECTOR: _____ _____
J. R. Costello, Reactor Systems Section (RSS) Date

OTHER INSPECTOR(S):

APPROVED BY: C. J. Hale 5/26/82
C. J. Hale, Chief, RSS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B, and Topical Report No. BQ-TOP-1.

B. SCOPE: This inspection was conducted to assess the effectiveness of Bechtel's QA program in the area of Evaluation of Supplier Performance/ Verification Activities and to check on the status of previous inspection findings.

PLANT SITE APPLICABILITY:

The contents of this report relate to the following dockets: 50-354, 50-387, and 50-388.

ORGANIZATION: BECHTEL POWER CORPORATION
SAN FRANCISCO POWER DIVISION
SAN FRANCISCO, CALIFORNIA

REPORT NO.: 99900522/82-01	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

1. It is not apparent that the requirements of EDPI-4.64.1 for reviewing and dispositioning quality surveillance reports are functioning properly. Hope Creek Quality Surveillance Report No. 96 required procurement supplier quality action by July 10, 1981. The inspector was unable to obtain any evidence during this inspection that the required action had been completed.

2. It is not apparent that the requirements for specificity concerning codes and standards contained in EDP-4.49 are being satisfied. EDP-4.49 required that applicable codes, standards and regulatory requirements have the issue and addenda properly identified and that these requirements be met in the design.

   The inspector examined four Hope Creek project specifications and found that specification 10855-A-075(Q) did not specify the issue and addenda of four out of five codes and standards listed while specification 10855-J-111(Q) did not specify the issue of ANSI N45.2 in effect. The inspector will review this matter further on the next inspection.

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Unresolved Item (80-03): The position of relying on IE Bulletin activities to evaluate the significance of a potential safety hazard, instead of evaluating per 10 CFR Part 21, has been submitted to NRC Headquarters for review.

   NRC Headquarters reply to the above concern stated that once a director or responsible officer of a company subject to 10 CFR Part 21, obtains information reasonably indicating that a defect exists, he must inform the Commission unless he knows that the Commission has already been adequately informed.

In the two cases discussed in the 80-03 report, both were reported under 10 CFR Part 50.55(e). The cases involved pilot solenoid valves and pipe supports for the Susquehanna project. Both cases were referred to the 10 CFR Part 21 Evaluation Committee who determined that these defects did not exist on any other active projects at San Francisco Power Division (SFPD). The committee also decided not to report these defects under 10 CFR Part 21 for nonactive projects at SFPD because the Commission was aware of the problem and was taking corrective action on all plants through IE Bulletins 79-01A, 79-01B, and 79-14. The inspector reviewed the action taken at SFPD and the required action requested by the IE Bulletins and concluded that the 10 CFR Part 21 Evaluation Committee actions were proper for these cases.

2. (Closed) Unresolved Item (81-03): The effectiveness of EDP-4.65 (Design Deficiency Processing) in implementing Section 9 (Design Corrective Action) of ANSI N45.2.11 could not be demonstrated during this inspection. This area will be examined further during a future inspection.

   Section II, No. 2 of the Nuclear Quality Assurance Manual (NQAM) has been revised as of April 19, 1982, to require Project QA to be responsible for documenting recommended corrective actions to minimize recurrence of design errors and to be responsible for tracking to ensure completion of the action. This revision to the NQAM requires a change to or cancellation of EDP-4.65 which had required that engineering track CAR's. This change in responsibilities should provide a more effective method of implementing Section 9 of ANSI N45.2.11.

E. OTHER FINDINGS OR COMMENTS:

Evaluation of Supplier Performance/Verification Activities - Applicable quality assurance and project procedures were examined to determine quality assurance program commitments. To verify implementation of these commitments, the following documents were examined: three quality surveillance reports, one project field supplier quality report, two supplier quality assurance manuals, five material requisitions, four supplier quality program evaluation reports, seven supplier quality program audit reports, four supplier evaluation review reports and three supplier performance evaluation reports. Relative to the documents examined, two unresolved items were identified. (See section C above.)

ORGANIZATION: BURNS AND ROE, INCORPORATED
ORADELL, NEW JERSEY

REPORT NO.: 99900503/82-01	INSPECTION DATE(S) 2/23/82 and 3/15-18/82	INSPECTION ON-SITE HOURS: 20

CORRESPONDENCE ADDRESS: Burns and Roe, Incorporated
ATTN: Mr. T. A. Hendrickson
Assistant to the President
550 Kinderkamack Road
Oradell, NJ 07649

ORGANIZATIONAL CONTACT: Mr. W. P. Rausch, Director of QA
TELEPHONE NUMBER: (201) 265-9351

PRINCIPAL PRODUCT: Architect Engineering and Consulting Services

NUCLEAR INDUSTRY ACTIVITY: The total effort committed to domestic nuclear activities is approximately 32% of the 2260 employee staff. Major projects include the design of Washington Public Power Supply System, Unit 2, post accident conditions update for Three Mile Island, Unit 2, and design verification for Oyster Creek.

ASSIGNED INSPECTOR: C. J. Hale for D. F. Fox, Reactor Systems Section (RSS) 5/17/82 Date

OTHER INSPECTOR(S):

APPROVED BY: C. J. Hale, Chief, RSS 5/17/82 Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B, and the FSAR for the Washington Public Power Supply Systems Unit 2 (WNP-2).

B. SCOPE: Determine the status of committed corrective action and preventive measures for previous inspection findings (Woodbury, New Jersey, offices) and design inspection (Richland, Washington, offices).

PLANT SITE APPLICABILITY:

WNP-2, Docket No. 50-397.

ORGANIZATION: BURNS AND ROE, INCORPORATED
ORADELL, NEW JERSEY

REPORT NO.: 99900503/82-01	INSPECTION RESULTS:	PAGE 2 of 6

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and revision 1 to B&R Project Instruction WNP-2-ED-003 dated December 22, 1981, the Project Engineering Manager (WNP-2 Project, Woodbury Office) did not obtain a copy of the latest issue of Title 10, Chapter 1, Part 21, for inclusion as Exhibit II in the project version of procedure ED-003 as evidenced by the fact that the issue of 10 CFR Part 21 that was included as Exhibit II in the current project version of the project procedure (WNP-2-ED-003), was dated August 1, 1980, whereas, the the current issue of 10 CFR Part 21 is December 18, 1981. Corrective actions and preventive measures were taken before the end of this inspection and no further written response is necessary.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and revision 1 to B&R Project Instruction WNP-2-PM-006 dated September 11, 1980, the receipt and number control of certain key project documents did not ensure that all revisions are received by the designated individual as evidenced by the fact that revision 5 of Project Instruction WNP-2-ED-010 (Calculations), dated June 23, 1981, was not received by the designated individual (the WNP-2 Project, Richland Office, holder of control copy No. 2) whose controlled set of Project Instructions contained superseded revision 4 of the Project Instruction WNP-2-ED-010, dated June 30, 1980.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and revision 5 of B&R Project Instruction WNP-2-ED-010, dated June 23, 1980, design calculation 5.51.053 (Environmental Analysis Outside Containment), sub-analyses of which were dated December 23, 1981, through January 22, 1982, was not identified with respect to status, nor checked, in accordance with procedural requirements. Specific examples of this nonconformance are as follows:

   a. Neither the lead sheet of calculation 5.51.053 nor the lead sheet of supporting sub-analyses (Events No. 1, 3, 4, and 10 others) were identified as "preliminary" or "final" even though all of the required lead sheets were signed and dated by the responsible Group Supervisor of the WNP-2 Project, Richland Office.

b. The responsible Group Supervisor did not assign another engineer or designer to check the calculations as evidenced by the fact that the signature of the checker on the lead sheets for certain sub-analyses (events 1 through 3 and 5 through 12) of calculation 5.51.053 was that of the responsible Group Supervisor of the WNP-2 Project, Richland Office, who also signed as the approver of these analyses.

c. Documented evidence did not exist that the assigned checker actually examined calculation 5.51.053 in accordance with section 2.4 of Standard PO15105G1 as evidenced by the omission from the calculation of the actual temperature, pressure, and "harsh environment" time duration data, and the reference source of these design bases/input data, for which the motor operators for containment isolation valves were environmentally qualified. This data is needed to support the conclusion of a sub-analyses (Event 5) that the "Motor operators for containment isolation valves are environmentally qualified to postulated environment."

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Deviation A.1 (80-01): Design control measures were not being applied to verify or check the adequacy of design.

   B&R Project Instruction WNP-2-ED-001 was revised as committed to include the requirement that "the preparer of a drawing, or change thereto, may not perform the required review by his discipline."

2. (Closed) Violation (80-02): Failure to meet 10 CFR Part 21 posting requirements in facilities where nuclear safety related activities were being conducted.

   B&R Project Procedure PM-014.1 was revised and issued as ED-003 on April 15, 1981, as committed. A notice, containing the information required by paragraph 21.6 of 10 CFR Part 21 was included as Exhibit I to Project Procedure ED-003 (and Project Instruction WNP-2-ED-003) and was posted in all affected facilities. The posting was verified by QA surveillance reports dated January and August 1981, and February 1982, as committed.

One nonconformance was identified in this area of the inspection (see B.1 above).

B&R committed to revise Project Instruction WNP-2-ED-003 to reflect the current issue of the 10 CFR Part 21 regulations by March 31, 1982, and to review the procedure semiannually to assure currency. No written response to this nonconformance is, therefore, required.

3. (Closed) Deviation A (80-02): Corrective action identified in B&R letter of response, dated June 5, 1980, to deviation A of NRC inspection report 80-01 was not completed as committed.

   B&R revised Project Instruction WNP-2-ED-001 as committed (see D.1 above). The importance of assuring that all corrective and preventive actions to NRC inspection findings have been completed as committed was reemphasized to the Quality Assurance organization and the WNP-2 Project QA Manager at the April 1981, QA Directors Staff Meeting.

4. (Closed) Unresolved Item (80-02): It appeared that B&R failed to report to NRC, under 10 CFR Part 21, that safety related switchgear was installed at WNP-2 in a manner (using top entry rigid electrical conduit) for which the switchgear had not been seismically qualified.

   Wylie Laboratories have subsequently performed seismic testing and analytical evaluation of typical Westinghouse switchgear installed with top entry rigid electrical conduit. They concluded in their report (WR-81-21, dated June 26, 1981), that the structural integrity of the switchgear, acceptable stress levels, and equipment response spectra levels for installed switchgear are equal to, or less than the originally qualified (by Westinghouse) switchgear levels. The Wylie report is to be incorporated into the NRC/NRR seismic qualification review process. Further action, if any, on this item is pending the results of the NRC/NRR review.

OTHER FINDINGS OR COMMENTS:

Design Inspection - Branch Technical Position Papers, sections of the WNP-2 FSAR pertaining to postulated piping failures in fluid systems and accident analyses, and applicable design control procedures were reviewed to determine the commitments, design bases and design measures employed by B&R to assure that the WNP-2 nuclear power station can be safety shutdown in the event of the postulated rupture of any high or moderate energy line outside of the reactor containment.

Drawings, instructions, calculations, specifications, reports, letters and memoranda, and other documentation related to the direct effects (pipe whip, jet impingement, etc.) and indirect effects (compartment temperature, pressure, humidity, water level, etc.) resulting from a postulated pipe rupture were examined to verify implementation of commitments.

The inspector noted that B&R pipe whip and jet impingement studies appear to be congruent with the current NRC guidance. Furthermore, B&R WNP-2 Project Engineering personnel stated that these studies are to be verified against as-built drawings and piping system "walkdowns" at the WNP-2 site. However, the inspector did not verify that the direct effects of a break in all high and moderate energy lines are scheduled to be evaluated because the complete list of all such postulated breaks was not available at the B&R Richland Office.

Compartment temperature and pressure analyses were performed by the Washington Public Power Supply System (WPPSS) and were not available for examination at the B&R Richland Office. Therefore, the NRC inspector could not verify that pipe ruptures identifies by WPPSS as requiring analyses for their effect on safe shutdown capability would represent the bounding or limiting cases for all compartments containing essential equipment in the WNP-2 nuclear power plant.

Two nonconformances, for failure to adhere to procedural requirements were identified in this area of the inspection (see B.2 and B.3 above).

ORGANIZATION: BURNS AND ROE, INCORPORATED
ORADELL, NEW JERSEY

REPORT NO.: 99900503/82-01	INSPECTION RESULTS:	PAGE 6 of 6

With respect to nonconformance B.2, the NRC inspector noted that a member of the B&R Project Director's staff was aware, for at least two weeks, that the WNP-2 Project Office's controlled copy of Project Instruction WNP-2-ED-010 was a year out of date, but had not notified the cognizant individual in Project Administration, nor otherwise caused it to be replaced with the current issue until identified by the NRC inspector.

With respect to nonconformance B.3.c, the NRC inspector determined that certain temperature, pressure, and "harsh environment" time duration data, were obtained via undocumented telephone conversations with WPPSS, who has assumed the responsibility for environmental qualification of all essential equipment for the WNP-2 site. Further, (1) the functionability of mechanical devices, such as valves, under the environmental conditions to which they may be subjected in the event of a pipe rupture has not been specifically addressed to date; and (2) sources of design input and design assumptions were not documented in inprocess calculation 5.51.050, (Pipe Breaks Outside Containment), making review of the calculation and its sub-analyses difficult without recourse to the originator. NRC Region V inspection report 50-397/82-06 provides additional information in this area, as well as, other onsite B&R activities.

ORGANIZATION: C&D BATTERIES, DIVISION OF ELTRA CORPORATION
PLYMOUTH MEETING, PENNSYLVANIA

REPORT NO.: 99900765/82-01	INSPECTION DATE(S): 1/4-8/82	INSPECTION ON-SITE HOURS: 25

CORRESPONDENCE ADDRESS: C&D Batteries
Division of Eltra Corporation
ATTN: Mr. George M. Moses
President
3043 Walton Rd.
Plymouth Meeting, PA 19462

ORGANIZATION CONTACT: Mr. T. P. Davis, Director Quality Assurance
TELEPHONE: (215) 828-9000

PRINCIPAL PRODUCT: Batteries, Battery Chargers, and Battery Racks

NUCLEAR INDUSTRY ACTIVITY: One percent of production devoted to nuclear products used by Electrical Utilities.

ASSIGNED INSPECTOR: L. B. Parker, Reactive Inspection Section (RIS) Feb. 12, 1982 Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes, Chief, RIS 2-12-82 Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B; and 10 CFR Part 21.

B. SCOPE: This inspection was made as a result of: (1) the issuance of a 10 CFR Part 21 report by Bechtel Power Corporation concerning defective welds in Palisades Nuclear Plant battery racks; (2) a Licensee Event Report by Pacific Gas and Electric Company's Diablo Canyon Power Plant Engineer reporting cracks in the cells of the station batteries; and (3) the issuance of a 10 CFR Part 21 report by Alabama Power Company's Farley Nuclear Plant concerning defective battery post seals.

A. VIOLATION:

Contrary to paragraph 21.21 of 10 CFR Part 21, procedures had not been adopted to implement 10 CFR Part 21.

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

None. This was the initial inspection of C&D Batteries, Plymouth Meeting, Pennsylvania.

E. OTHER FINDINGS OR COMMENTS:

1. Regional Requests

a. A 10 CFR Part 21 report by Bechtel Power Corporation, Ann Arbor, Michigan, was made concerning battery rack defective welds. During modification and installation of the battery racks at the Palisades Nuclear Plant Site, several defective welds were observed. C&D, Bechtel, and Consumer Power personnel inspected the defective welds at the Palisades site on October 14-15, 1981. On October 16, 1981, Bechtel personnel inspected the prototype rack at Plymouth Meeting, Pennsylvania, (Prototype rack had been seismically tested by Wyle Laboratory, Huntsville, Alabama on Wyle Job No. 43450, December 7, 1976.) Subsequent to these inspections the following actions were taken in regard to the rack weld deficiencies: (1) C&D weld procedure attachments 1, 2, & 3 were added to C&D Welding Specification Section "B" W-1B by Rev. 2, on October 18, 1981; (2) the defective racks have been replaced at Palisades; (3) 20 RD-660 Frames, 8 RD-924 Frames, and 40 RE-2089 Brackets were returned to the East Greenville, Pennsylvania, C&D plant by Bechtel on C&D Return Material Authorization 22377; and (4) the USNRC RI and seven customers were notified by C&D of the battery rack deficiencies. (See Follow-up Item E.3.)

b. A Licensee Event Report by the Diablo Canyon Plant Engineer was made relative to cracking observed in the cells of the station batteries. A C&D field representative visually inspected 300 cells (5 batteries) at the Diablo Canyon Nuclear Plant. Ten of

the cells were found to be cracked/crazed, and one active cell was determined to be seeping. Two other cells with seepage had been removed and were stored in the Diablo Canyon site maintenance shop. At Millstone Nuclear Generating Stations 1 and 2, 142 cells were visually inspected by C&D personnel, with 3 cells being found crazed and no dampness evident on the bottom of the cells. Twenty percent of the total rib areas in 120 cells at the Vermont Yankee Nuclear Generating Station were also inspected by C&D personnel with this inspection not revealing any leakage, dampness, or crazing/cracking of the containers. In a letter to the USNRC RI, C&D Batteries stated that as a result of the above nuclear site inspections, and field inspections of the condition over the past nine years in both utility and telephone sites, they did not believe the condition represented a "substantial safety hazard."

In May 1972, the plastic cell container (type purchased in 1969 for use at Diablo Canyon) was redesigned and the integral rib block was replaced by a floating rib. Pacific Gas and Electric Company, P. O. 4R56705 (November 6, 1981), was placed with C&D Batteries to replace the integral rib block cell batteries with redesigned batteries. USNRC RI and 20 C&D customers were notified of these deficiencies.

c. A 10 CFR Part 21 report by Alabama Power Company's Farley Nuclear Plant was made concerning a defective post seal design that allowed electrolyte fumes to escape. C&D corrected this deficiency in early 1973; the new post seal utilizes a pure lead bushing molded into a hard rubber casing which, when cemented in place, reduces the electrolyte fumes which escape. Farley was the only nuclear site which used batteries with the original design, C&D replacement batteries utilizing the new seal design were shipped to Farley on December 26, 1980 (Alabama Power Company No. 68501).

2. Implementation of 10 CFR Part 21 - Posting in accordance with 10 CFR Part 21 was accomplished at the Plymouth Meeting, Pennsylvania plant. (See A above for violation on paragraph 21.21 notification requirements.)

3. Follow Up Item -

The adequacy of welding controls for battery rack fabrication was not reviewed during this inspection. This subject and responses from C&D customers in regard to battery rack deficiency notification will be examined in a subsequent inspection.

ORGANIZATION: COMBUSTION ENGINEERING, INC.
POWER SYSTEMS GROUP
WINDSOR, CONNECTICUT

REPORT NO.: 99900401/82-01	INSPECTION DATE(S) 3/22-26/82	INSPECTION ON-SITE HOURS: 27

CORRESPONDENCE ADDRESS: Combustion Engineering, Inc.
Power Systems Group
ATTN: Mr. M. R. Etheridge, Vice Pres., Gen. Services
1000 Prospect Hill Road
Windsor, CT 06095

ORGANIZATIONAL CONTACT: Mr. C. W. Hoffman, Director, Group QA
TELEPHONE NUMBER: (203) 688-1911

PRINCIPAL PRODUCT: Nuclear Steam Supply Systems

NUCLEAR INDUSTRY ACTIVITY: The Power Systems Group Combustion Engineering (CE) has contracts for 22 of the domestic reactor units to date, of which 14 are in the design and construction phase. In addition, they have modification/repair/service contracts for 22 reactor units.

ASSIGNED INSPECTOR: R. H. Brickley 4/14/82
R. H. Brickley, Reactor Systems Section (RSS) Date

OTHER INSPECTOR(S):

APPROVED BY: C. J. Hale 4-14-82
C. J. Hale, Chief, RSS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and Topical Report CENPD-210-A.

B. SCOPE: Design inputs, design document control, and status of previous inspection findings.

PLANT SITE APPLICABILITY:

Not Identified.

ORGANIZATION: COMBUSTION ENGINEERING, INC.
POWER SYSTEMS GROUP
WINDSOR, CONNECTICUT

REPORT NO.: 99900401/82-01	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCES:

Contrary to Section 17.5 of CENPD-210-A; Section 2.2 of Quality Assurance of Design Procedure (QADP) 5.3 (Interface Control) Revision 1, dated May 1, 1980; and Section 6.4.2 of Plant Engineering QA Procedures (PEQAP) 001 (Design Quality Assurance Procedure) Revision 0, dated October 1, 1974; the following specifications did not have the required documentary evidence of interface reviews on file:

Project Specification No. 6473-PE-231, Revision 5, dated January 12, 1981, (QADP 5.3); General Specification No. 00000-PE-707, Revision 2, dated February 19, 1975, (PEQAP 001).

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Nonconformance (81-02): Quality Assurance of Design Procedures do not address implementation of Section 9 (Corrective Action) of ANSI N45.2.11-1974.

   Previously completed corrective actions were identified in Inspection Report No. 99900401/81-03, paragraph D.1. The remaining item, documentation of required training, was audited by engineering QA personnel, deficiencies identified and corrected, and all affected personnel were verified as receiving the required training.

2. (Open) Nonconformance (81-03) - Certain operations, designated on the Integrated Manufacturing Quality Plan as being mandatory hold points, were performed by the supplier without either the Power Systems Group representative being present or a written waiver being issued.

   Combustion Engineering's response to this nonconformance is under review by the NRC Region IV staff.

3. (Open) Nonconformance (81-03) - Record checklist requirements were not implemented in documentation packages; e.g., required material certification reviews, material test reports of filler material, radiographs, and qualification of welders and welding procedure specifications.

   Combustion Engineering's response to this nonconformance is under review by the NRC Region IV staff.

4. (Open) Nonconformance (81-03) - No in-process audits were performed during fabrication of Component Cooling Water Heat Exchangers in regard to the welding processes used.

   Combustion Engineering's response to this nonconformance is under review by the NRC Region IV staff.

5. (Open) Nonconformance (81-03) - Group Quality Control surveillance or record review has not verified completion or fulfillment of Code special process requirements by external suppliers.

   Combustion Engineering's response to this nonconformance is under review by the NRC Region IV staff.

E. OTHER FINDINGS OR COMMENTS:

1. Design Inputs: Applicable procedures from the QADP Manual were examined to determine that procedures have been prepared and approved, consistent with program commitments. Five System 80, eight project, one general specifications, and associated reviews and input verification documents were examined to determine that the design input procedures were properly and effectively implemented. One nonconformance was identified and is discussed in paragraph B above.

2. Design Document Control: Applicable procedures from the QADP manual were examined to determine that procedures have been prepared and approved consistent with program commitments. Four System 80 and six project specifications were examined for internal distribution; and two project specifications were examined for external distribution to determine that design document control procedures were being properly and effectively implemented. In the area inspected, no nonconformances were identified.

ORGANIZATION: COMSIP, INC.
CUSTOMLINE DIVISION
LINDEN, NEW JERSEY

REPORT NO.: 99900771/82-01	INSPECTION DATE(S) 3/22-26/82	INSPECTION ON-SITE HOURS: 30

CORRESPONDENCE ADDRESS: Comsip, Inc.
Customline Division
ATTN: Mr. C. M. Ferdinand, Manager, Quality Assurance
1418 E. Linden Avenue, P. O. Box 152
Linden, NJ 07036

ORGANIZATIONAL CONTACT: Mr. C. M. Ferdinand
TELEPHONE NUMBER: (201) 486-1272

PRINCIPAL PRODUCT: Control Panels

NUCLEAR INDUSTRY ACTIVITY: Approximately 50% of the work is devoted to the commercial nuclear industry.

ASSIGNED INSPECTOR: R. E. Ellershaw — 5-19-82
R. E. Ellershaw, Reactive & Component Program Section (R&CPS) — Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes — 5-20-82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made as a result of a request by NRC's Region III office to inspect specific control panel fabricators due to identified weld defects found in panels that have been furnished to the Byron Station, Units 1 and 2; Braidwood Station, Units 1 and 2; Midland Plant, Units 1 and 2; and Callaway Plant, Unit 1. Comsip, Inc., has provided main control panels to Callaway Plant, Unit 1.

PLANT SITE APPLICABILITY:

50-454 and 50-455; 50-456 and 50-457; 50-329 and 50-330, and 50-483.

ORGANIZATION: COMSIP, INC.
CUSTOMLINE DIVISION
LINDEN, NEW JERSEY

REPORT NO.: 99900771/82-01	INSPECTION RESULTS:	PAGE 2 of 5

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50, American Welding Society (AWS) Code D1.1 and QA Manual Procedure 9.0, paragraph 5.1, neither the procedure specification nor the qualification record of the gas metal arc welding process in Specification No. 5875-MP-1 addressed progression to be used during vertical position welding, which is an essential variable.

   Further, the specific value for gas flow rate, an essential variable, was not reported in the qualification.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and AWS D1.1-76 paragraph 5.10.3, although the gas metal arc welding (GMAW) process in Specification No. 5875-MP-1 has been used for making the fillet welds in the main control panels for Palo Verde Nuclear Generating Station, Unit 3, no T-test fillet welds and resulting macroetch test specimens were made.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and QA Manual Procedure 9.0, paragraph 3.1, it has not been assured that welding, a special process affecting quality and subcontracted by Comsip for all nuclear work, has been accomplished using qualified personnel, in accordance with applicable codes and specifications, as evidenced by the following observations made by the NRC inspector during a visit to H. R. Henrich, Inc., the subcontractor performing the fabrication/welding of the main control panels for Palo Verde Nuclear Generating Station, Unit 3:

   a. The welding power sources (ammeters and voltmeters) are not calibrated nor were there any tong meters available to assure accuracy of the equipment.

   b. The following AWS D1.1 essential variables were being violated while GMAW was being performed:

(1) Gas Flow Rate - the procedure requires 12-20 CFH, but 28 CFH was being utilized, which is in excess of the 25% maximum permitted increase in flow rate.

(2) Voltage - the procedure required 24-28, but 20-21 was being used, which is in excess of the permitted change of ± 7% from the specified mean arc voltage.

c. An individual who was not qualified as a welder had performed plug welding using the gas tungsten arc welding (GTAW) process. Further, a GTAW procedure did not exist, and there was no filler metal identity.

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50, QA Manual Procedure 10.1 and AWS D1.1, paragraphs 3.6 and 3.10, the NRC inspector observed the following with respect to welds in painted control panels for Palo Verde Nuclear Generating Staion, Unit 3, which had been accepted in receiving inspection reports dated October 30, and December 18, 1981, by the Quality Assurance Representative:

a. Undercut in excess of 1/32" in depth.

b. Weld wire remnants up to 2½" long.

5. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and AWS D1.1, Comsip, Inc., reviewed and accepted a welding material certification from Metalfab, Inc., which did not provide chemical analysis of all of the elements required by the applicable AWS specification.

The certification states the welding material to be E-7014, which is included in AWS specification A 5.1. The chemical requirements of A 5.1 address the reporting of Manganese, Silicon, Nickel, Chromium, Molybdenum, and Vanadium. The certification addresses Carbon, Manganese, Sulfur, Phosphorus, and Silicon, thus excluding four required elements.

ORGANIZATION: COMSIP, INC.
CUSTOMLINE DIVISION
LINDEN, NEW JERSEY

REPORT NO.: 99900771/82-01	INSPECTION RESULTS:	PAGE 4 of 5

6. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and QA Manual Procedure 6.4, paragraph 5.5, the following examples were observed of different drawing revision numbers being used in the manufacturing process to those listed on the Project Drawing Control Board, and the affected assemblies were not identified as being nonconforming:

Drawings listed on Project Drawing Control Board	Drawings being used in Manufacturing
5875-17 Sheet 6, Rev. 5	5875-17 Sheet 6, Rev. 4
5875-17 Sheet 7, Rev. 6	5875-17 Sheet 7, Rev. 5
5875-17 Sheet 17, Rev. 6	5875-17 Sheet 17, Rev. 5
5875-17 Sheet 19, Rev. 11	5875-17 Sheet 19, Rev. 10
5875-17 Sheet 20, Rev. 9	5875-17 Sheet 20, Rev. 8
5875-17 Sheet 21, Rev. 8	5875-17 Sheet 21, Rev. 7

It should be noted that the above drawings had been issued to the shop supervisor by the drawing distribution control clerk, however, the shop supervisor had not issued the latest revisions to the shop personnel.

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. NRC Region III Inspection Request - This area of the inspection was conducted by review of records pertaining to the main control panels provided to the Callaway Plant, Unit 1, and review and observation of current welding activities related to the fabrication of the main control panels being supplied to Palo Verde Nuclear Generating Station, Unit 3. The welding procedure specification and its qualifications, welder qualifications, welding material control, and welding inspection were reviewed, and observations made of inprocess welding activities. As a result, nonconformance B.1 through B.5 were identified.

Comment: In regard to nonconformance B.4, visual inspection for other types of defects in welds was impaired by the presence of a paint film of up to 6 mils thickness.

ORGANIZATION: COMSIP, INC.
CUSTOMLINE DIVISION
LINDEN, NEW JERSEY

REPORT NO.: 99900771/82-01	INSPECTION RESULTS:	PAGE 5 of 5

2. Drawing Control: - This area of the inspection was conducted by review of the Project Drawing Control Board and Drawing Status Log, which identify the latest, approved project drawings, and comparing against the drawings actually in use in the manufacturing area. Further, the implementation of controls for initiating drawing revisions by Design Control Change Notices was reviewed. As a result of this inspection, nonconformance B.6 was identified.

ORGANIZATION: CORNER AND LADA COMPANY, INCORPORATED
CRANSTON, RHODE ISLAND

REPORT NO.: 99900349/82-01	INSPECTION DATE(S) 4/5-8/82	INSPECTION ON-SITE HOURS: 24

CORRESPONDENCE ADDRESS: Corner and Lada Company, Incorporated
ATTN: Mr. W. T. Allen, III
Manager, Quality Assurance
1341 Elmwood Avenue
Cranston, Rhode Island 02910

ORGANIZATIONAL CONTACT: Mr. W. T. Allen III
TELEPHONE NUMBER: (401)461-1300

PRINCIPAL PRODUCT: Nuclear Component Supports

NUCLEAR INDUSTRY ACTIVITY: Commercial nuclear production of Corner and Lada Co., Inc., Cranston, Rhode Island represents 40% of total company production. Five nuclear contracts are presently in-house for current and future production.

ASSIGNED INSPECTOR: J. Barnes for 5-20-82
J. W. Sutton, Reactive & Components Program Section (R&CPS) Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes 5-20-82
I. Barnes, Chief, R&CPS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: Status of previous identified findings, nonconformance/corrective action, review of vendor activities.

PLANT SITE APPLICABILITY: Not identified.

ORGANIZATION: CORNER AND LADA COMPANY, INCORPORATED
CRANSTON, RHODE ISLAND

REPORT NO.: 99900349/82-01	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Violation (80-01) - Failure to comply with 10 CFR 21 relative to evaluation of possible deviations and notification to purchasers of parts with possible deviations.

   The inspector reviewed the corrective action taken by Corner and Lada (C&L) to prevent recurrence. The inspector reviewed for content the revised standard specification procedure ST-CFR-21, documentation of the training session held on February 17, 1981, and the corrective action request issued on January 30, 1981. In addition, the inspector reviewed 10 letters sent by C&L to affected customers and the load limit evaluation performed by C&L to determine if a safety hazard existed.

   As a result of this review, the inspector determined that adequate corrective action and preventive measures had been taken by C&L to prevent recurrence of this reported violation.

2. (Closed) Deviation A (80-01) - C&L not reviewing and approving drawings as required by procedure ST-150.

   The inspector reviewed the revised corrective action request, two design drawings, 9 drawing change requests and the cross log revision documentation, to determine adherence to C&L's corrective action commitments. The inspector determined that the corrective action taken will prevent recurrence of this problem.

ORGANIZATION: CORNER AND LADA COMPANY, INCORPORATED
CRANSTON, RHODE ISLAND

REPORT NO.: 99900349/82-01	INSPECTION RESULTS:	PAGE 3 of 3

3. (Closed) Deviation B (80-01) - Reamed holes in sway strut paddles do not meet drawing requirements. The inspector reviewed the corrective action taken by C&L to prevent recurrence of this problem. The measurement instruments purchased were examined and found to be acceptable. The inspector reviewed revisions to drawings indicating dimensional changes to the reamed hole in the rigid sway strut paddle.

   As a result of the review of C&L corrective action, the inspector determined that the corrective action taken by C&L will prevent recurrence of this deviation.

E. OTHER FINDINGS:

1. Nonconformance/Corrective Action - The inspector reviewed Section 10 of the QA Manual, 18 nonconformance material reports, 20 corrective action reports and associated documentation, to determine compliance to QA/QC requirements. Segregation areas designated for storage of nonconforming items were inspected. Relative to the documents examined, the inspector determined that activities relating to the control and disposition of nonconforming items complied with C&L QA/QC program requirements.

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ORGANIZATION: DRAVO CORPORATION
PIPE FABRICATION DIVISION
MARIETTA, OHIO

REPORT NO.: 99900017/82-01	INSPECTION DATE(S) 3/29-4/2/82	INSPECTION ON-SITE HOURS: 78

CORRESPONDENCE ADDRESS: Dravo Corporation
Pipe Fabrication Division
ATTN: K. Anderson, General Manager
1115 Gilman Street
Marietta, Ohio 45750

ORGANIZATIONAL CONTACT: W. A. Molvie, Quality Assurance Manager
TELEPHONE NUMBER: (614) 373-7541

PRINCIPAL PRODUCT: Nuclear Piping Subassemblies

NUCLEAR INDUSTRY ACTIVITY: Approximately 10% of production devoted to nuclear products.

ASSIGNED INSPECTOR: H. W. Roberds — 5/19/82
H. W. Roberds, Reactive and Components Program Section (R&CPS) — Date

OTHER INSPECTOR(S): J. Conway, R&CPS

APPROVED BY: I. Barnes — 5/20/82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B

B. SCOPE: This inspection was made as the result of: (1) a 10 CFR Part 50.55(e) report by TVA relative to undocumented weld buildups on ASME Section III Class 1, 2, and 3 pipe ends supplied to Watts Bar Nuclear Plant, Units 1 and 2; and (2) the identification at Callaway, Units 1 and 2 of inadequate surface preparation of safety-related piping welds for performance of liquid penetrant inspection.

PLANT SITE APPLICABILITY: Undocumented weld buildups - 50-390, and 50-391. Inadequate weld surface preparation for liquid penetrant inspection - 50-483, and 50-486.

ORGANIZATION: DRAVO CORPORATION
PIPE FABRICATION DIVISION
MARIETTA, OHIO

REPORT NO.: 99900017/82-01	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 9 of the QA Manual, certain inspection and verification operations on the weld joint data forms, applicable to the attachment of nameplates to piping subassemblies, had been signed-off by the weld foreman, as completed, although the nameplates were not attached and were observed in the record package.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Sections 15.4.2 and 15.4.3 of Dravo's Nuclear QA Manual, corrective action implementation date and verification followup were not documented with respect to an internal audit finding pertaining to use of unapproved welding wire.

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Inadequate Surface Preparation For Liquid Penetrant Inspection of Piping Welds Fabricated by Dravo - As the result of a United Engineers & & Constructors (UE&C) Surveillance Representative observing a Dravo inspector performing an improper magnetic particle examination on an ASME Section III piping subassembly for the Seabrook Nuclear Station, Dravo notified Callaway, Wolf Creek Generating Station, and Seabrook Nuclear Station of a potential deficiency relative to incomplete examination of certain welds. In the process of reexamination of welds on Dravo piping subassemblies by contractor personnel at Callaway, it was reported that liquid penetrant examination could not be performed because of inadequate surface preparation of welds. As a result of the above deficiencies Dravo has taken the following corrective action and steps to preclude recurrence:

ORGANIZATION: DRAVO CORPORATION
PIPE FABRICATION DIVISION
MARIETTA, OHIO

REPORT NO.: 99900017/82-01	INSPECTION RESULTS:	PAGE 3 of 4

a. The inspector responsible for the inadequate inspection resigned from the company and all assemblies in the Dravo shop that had inspections performed by this individual were reinspected.

b. Training sessions have been given to all inspection personnel relative to ASME Code and Dravo procedure requiements.

c. Standards have been developed to demonstrate inspection surface requirements.

d. The Chief Inspector (Level III Examiner) monitors the work of each Dravo inspector on a weekly basis, and records are maintained to attest to this surveillance.

The inspection revealed that other nuclear facilities could have similar deficiencies but were not included in Dravo's contract review, in that, the review was made on only work performed during the last half of 1980.

2. Nuclear Regulatory Commission, Region II Referral of Undocumented Weld Buildup on Safety-Related Piping Fabricated by Dravo -

a. In February 1980, TVA notified Dravo that they had noted indications on butt welds while performing UT (baseline inspection). Both TVA and Dravo agreed that the indications were the result of weld buildups made in the shop. These weld buildups had not been documented in accordance with Code requirements. Dravo was able to reconstruct from fabrication records the documentation required for the identified suspect welds with the exception of 14 which had O.D. buildups. In September 1980, Dravo sent TVA a nonconformance report documenting the 14 sketches for the Watts Bar contract and recommending that the pipe assemblies containing the undocumented weld buildups be "used as is." Dravo's corrective action to preclude undocumented weld buildups in the future included revised procedures to incorporate better control of weld material and a QA review of weld joint data cards. In addition ECN-1 "Instructions for Build-Up" was written to include the required nondestructive examinations and documentation for weld buildups on all ASME Class 1, 2, and 3 work.

ORGANIZATION: DRAVO CORPORATION
PIPE FABRICATION DIVISION
MARIETTA, OHIO

REPORT NO.: 99900017/82-01	INSPECTION RESULTS:	PAGE 4 of 4

b. On May 28, 1980, the engineering organization generated a deviation request relating to the weld "buildup" problem and recommended corrective action to establish an Engineering Change Notice (ECN) system and incorporate it into the QA Manual. There was no evidence that the QA organization acknowledged the deviation request nor followed through on implementation of the recommended corrective action. This item will be further reviewed during a future inspection.

c. An NRC inspection of weld buildup documentation was performed by comparison of pipe cutting sheets (which make provisions for indicating whether a buildup is required) with subassembly fabrication records. Subassemblies from Seabrook, Units 1 and 2, Wolf Creek, and Hope Creek, Units 1 and 2, were included in the inspection sample. Fabrication records showed absence of documentation of buildup being performed in only one instance, from a total of six subassemblies indicated by cutting sheets to require buildup; i.e., Hope Creek, Sketch E3035-117, Class 2.

Examination of the specific requirements applicable to the TVA Watts Bar contract showed that the failure to document certain weld buildups at pipe ends was related to QA program implementation rather than failure to define requirements. Review of General Fabrication Procedure SP-1 for this contract indicated buildups were required to be reported to the Engineering Department, in order that Shop Sketches would be appropriately revised.

ORGANIZATION: ENERGY INCORPORATED
IDAHO FALLS, IDAHO

REPORT NO.: 99900514/82-01	INSPECTION DATE(S) 4/6-8/82	INSPECTION ON-SITE HOURS: 24

CORRESPONDENCE ADDRESS: Energy Incorporated
ATTN: Mr. W. V. Botts
President and Chairman
P. O. Box 736
Idaho Falls, Idaho 83401

ORGANIZATIONAL CONTACT: T. E. Didesch, QA Manager
TELEPHONE NUMBER: (208) 529-1000

PRINCIPAL PRODUCT: Engineering Consultants

NUCLEAR INDUSTRY ACTIVITY: Approximately 43% to 64% of the Energy Incorporated staff of 280 personnel are assigned to safety-related projects for the nuclear industry.

ASSIGNED INSPECTOR: _____ Date
R. H. Brickley, Reactor Systems Section (RSS)

OTHER INSPECTOR(S): J. L. Carter, Reactor Systems Branch (RSB)/NRR
J. Guttmann, RSB/NRR
T. Y. C. Wei, Argonne National Laboratory

APPROVED BY: _____ Date
C. J. Hale, Chief, RSS

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B

B. SCOPE: Initial management meeting and a special inspection in response to a request from NRR, regarding validation of the computer code RETRAN.

PLANT SITE APPLICABILITY: Not identified.

ORGANIZATION: ENERGY INCORPORATED
IDAHO FALLS, IDAHO

REPORT NO.: 99900514/82-01	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

Contrary to the requirements of Section 21.6 of 10 CFR Part 21, Energy Incorporated (EI) did not have posted: (1) current copies of Section 206 of the Energy Reorganization Act of 1974, (2) the name of the individual to whom reports may be made, and (3) a statement as to where the regulations/procedures may be examined.

B. NONCONFORMANCES:

Contrary to the requirements of Criterion V of 10 CFR Part 50, Appendix B and Section III of EI Standard Operating Procedure IX-I (Compliance with 10 CFR Part 21), EI purchase orders No. 14896, for seismic testing of safety-related equipment, and No. 14920, to fabricate isolation signal logic decoder boards classified as safety-related, did not specify that the provisions of 10 CFR Part 21 apply.

C. UNRESOLVED ITEMS:

None

D. OTHER FINGINGS OR COMMENTS:

1. Initial Management Meeting - A meeting was conducted with the management of Energy Incorporated to acquaint them with the Licensee Contractor Vendor Inspection Program (LCVIP), the NRC organization relative to the Vendor Programs Branch, and the types of documents generated and processed in implementing the program.

2. RETRAN Computer Code - This special inspection is part of a series of inspections being conducted at the request of NRR regarding the development, verification, and use of the RETRAN computer code by the nuclear industry. The basic objectives of these inspections are to assure that the RETRAN computer code has been developed, maintained, and modified in accordance with the design control measures contained in ANSI N45.2.11 - 1974; and to verify that the organizations' computer code activities address the requirements of 10 CFR Part 21, 10 CFR Part 50.55(e) and 50.59, as applicable.

ORGANIZATION: ENERGY INCORPORATED
IDAHO FALLS, IDAHO

REPORT NO.: 99900514/82-01	INSPECTION RESULTS:	PAGE 3 of 3

A review of the RETRAN files disclosed that the code had not been developed, maintained, and modified in accordance with the EI Quality Assurance Manual and its implementing procedures. In addition, a review of the contract agreement between the Electric Power Research Institute and EI disclosed that no QA program requirements had been imposed on these activities. EI personnel stated that RETRAN was developed and maintained in accordance with the EI QA program; however, there was no formal documentation of their activities, as would be required by the QA program. The current EI QA program and its implementing procedures were inspected as they relate to computer codes activities. Eleven sections of the Quality Assurance Manual, five sections of the Engineering Procedures Manual, seven sections of the Software Procedures Manual, and one Standard Operating Procedure (SOP) were reviewed to determine their conformance with the applicable requirements of ANSI N45.2.11-1974 and NRC reporting requirements. A verification of the degree of implementation of 10 CFR Part 21 was obtained by examination of the SOP to implement 10 CFR Part 21, one official bulletin board, and three purchase orders.

The review of the EI QA program and implementing procedures disclosed that minor revisions are needed to the EI Quality Assurance Manual and its implementing procedures for clarification purposes; e.g., restrictions on use of supervisor as independent reviewer; defining terms like periodic and significant; and use of correct checklists for input and independent reviews. The specific items needing revision were discussed with cognizant EI management. The incorporation of these items into the QA program and their implementation will be reviewed during a future inspection.

The inspection of the implementation of 10 CFR Part 21 requirements resulted in the violation and nonconformance identified in A and B above.

In regard to the violation identified in A above, it should be noted that: (1) a portion of the complete text of Section 206 of the Energy Reorganization Act of 1974 had been omitted; and (2) the individual to whom reports may be made differed from the one identified in the SOP.

ORGANIZATION: EXIDE CORPORATION
RICHMOND, KENTUCKY

REPORT NO.: 99900359/82-01	INSPECTION DATE(S) 3/16-19/82	INSPECTION ON-SITE HOURS: 27

CORRESPONDENCE ADDRESS: Exide Corporation
ATTN: Mr. Charles Reichart
Contracts Administrator
101 Gibraltor Rd.
Horsham, PA 19044

ORGANIZATIONAL CONTACT: Mr. Earl Price, Plant QA Manager
TELEPHONE NUMBER: (606) 624-1000

PRINCIPAL PRODUCT: Lead Acid Batteries

NUCLEAR INDUSTRY ACTIVITY: The Richmond, Kentucky, plant nuclear output, based on sales is 8%.

ASSIGNED INSPECTOR: _____ 5-3-82
R. E. Oller, Reactive & Components Program Section (R&CPS) — Date

OTHER INSPECTOR(S):

APPROVED BY: _____ 5-3-82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

1. BASES: 10 CFR Part 50, Appendix B.

2. SCOPE: Status of previous inspection findings; manufacturing process control; change control, and nonconformances and corrective action.

PLANT SITE APPLICABILITY:

Perry Nuclear Station, Units 1 and 2, Dockets 50-440 and 50-441

ORGANIZATION: EXIDE CORPORATION
RICHMOND, KENTUCKY

REPORT NO.: 99900359/82-01	INSPECTION RESULTS:	PAGE 2 of 6

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Deviation A (79-01): Failure to include the purchase order number in the identification of 60 type 2 GN-15 batteries, as required by paragraph 8.3.7 of the QA Manual, Revision 8.

   The inspector verified that in accordance with the vendor's response letter, dated June 19, 1979, review by Exide had established that the stationary battery post design could not accommodate the application of the P.O. number. To resolve this problem, Exide has revised paragraph 8.3.7 of the QAM to delete this requirement. The current practice is to identify the batteries by stamping the posts with codes traceable to test data reports which identify the type, catalog designation, location, shipping date and P.O. number.

2. (Closed) Deviation B (79-01): Failure to provide MRB hold areas for segregation of nonconforming manufactured parts, subassemblies, and assemblies, as required by paragraph 15.9 of the QA Manual, Revision 8.

   The inspector verified by observations in the shop, that in accordance with the vendor's response letter, dated June 19, 1979, four MRB hold areas are now identified in the shop with signs and boundary paint marks. Items placed in these areas are red tagged and monitored on a daily basis by the assigned QC area controller.

ORGANIZATION: EXIDE CORPORATION
RICHMOND, KENTUCKY

REPORT NO.: 99900359/82-01	INSPECTION RESULTS:	PAGE 3 of 6

3. (Closed) Deviation C (79-01): Failure to define and document the effective date of corrective action for Corrective Action Requests Nos. R-006 and R-013, as required by paragraph 16.4.2 of the QA Manual, Revision 8.

   The inspector verified that in accordance with the vendor's response letter, dated June 19, 1979, the two above CARs and current CARs had the corrective actions defined, signed, and dated by the plant QC Manager. Discussion, however, established that the requirements of paragraph 16.4.2 of the QAM were not clear, and the Exide QA Engineer indicated this paragraph will be revised to more clearly define this requirement.

4. (Closed) Deviation D (79-01): Failure to perform and document yearly audits in the areas of M/P cell assembly, stationary cell assembly, and plate finishing prior to March 30, 1979, and of the areas of casting/pasting/filling after August 25, 1977, as required by paragraph 18.3.1 of the QA Manual, Revision 8.

   The inspector verified that in accordance with the vendor's response letters dated June 19 and November 1, 1979, the entire Richmond plant QA program was audited on June 20, 1978, by the Chief Engineer, and on April 13, 1979, by the Manager, Design Engineering, and more recently by a management audit team.

   The inspector also determined that while procedure QCP-57.0, which controlled the audits by QA management, listed nine production activities which would be audited on an annual basis, the assigned checklist used by the auditors, did not specifically address the nine areas. The checklist, instead, addressed the entire QA program, and it could not be specifically related to the nine production activities. The Exide QA Engineer indicated he would revise the checklist to clarify this condition.

5. (Closed) Deviation E (79-01): Failure to maintain the required melt time of 15 seconds and a mating time of 20 seconds for stationary cells, as required by paragraph 3.8.7.a of the Temporary Manufacturing Requirement No.14.1(R), dated May 16, 1978, and failure to air test the stationary cells at both 1.5 and 2.0 psi as required by Special Manufacturing Instruction No. 6, dated July 26, 1978.

ORGANIZATION: EXIDE CORPORATION
RICHMOND, KENTUCKY

REPORT NO.: 99900359/82-01	INSPECTION RESULTS:	PAGE 4 of 6

The inspector verified that in accordance with the vendor's response letters dated June 19 and November 1, 1979, the TMI No. 14.1(R), dated May 16, 1978, was in error and it was revised on May 9, 1979, to correct the melt and mating time to minimum values of 15 and 20 seconds, respectively. With regard to the air test, the SMI No. 6 was cancelled and superseded by the revised TMI which specified the air test shall be performed only at 1.5 psi for 15 seconds minimum. This TMI was subsequently superseded by Manufacturing Requirement No. 102, Section 20.6, issued August 24, 1981. These activities are currently being monitored on a weekly basis by the QC area controllers and recorded on checklists.

6. (Closed) Deviation F (79-01): Failure to indicate specific hold points in documents controlling manufacturing, inspection, and test activities, to accomodate customer imposition of mandatory inspection hold points, as required by paragraph 10.12 of the QA Manual, Revision 8.

   The inspector verified that in accordance with the vendor's response letters dated June 19 and November 1, 1979, the procedure controlling establishment of hold points is No. QCP 60.0 and a "Customer Contract-Quality Assurance Checklist." This QCP and checklist were revised on November 1, 1979, to reflect organizational changes. They were subsequently superseded by procedure QAP-60.0 on September 22, 1981.

   Review by the inspector of QAP-60.0 and a current Customer Contract QA/C Checklist for Exide Order No. 77706/77709 for Perry Nuclear Station established that this checklist provided for Customer Witness and Hold Points.

7. (Open) Unresolved Item E.3.b.1 (79-01): Paragraph 7.11 of the QA Manual, Revision 8, and paragraph 4.2 of the QC Procedure No. 30.1, dated June 13, 1977, require that the checker at receiving initial each invoice upon receipt of purchased material. In practice, the checker initials the Bill of Lading and initiates a Receiving Report.

   The inspector verified that the statements in the QA manual and QA procedure were in error since the invoices do not go to the receiving checker, but do go directly to the accounting department. The Exide QA Engineer indicated that the QA manual and QC procedure will be revised to reflect the actual practice.

8. (Closed) Unresolved Item E.3.b.2 (79-01): Due to the area identification on the audit checklist being different from the audit area identification in the QC procedure, the inspector was unable to determine that areas were audited as required.

   The inspector found during the current inspection that this item is a duplicate of deviation D and is closed.

E. OTHER FINDINGS OR COMMENTS:

1. Manufacturing Process Control: The inspector reviewed seven sections of the Exide QA manual which were applicable to the GN (nuclear) type stationary battery parts manufacture, assembly, tests, inspections, QC monitoring, and shipping.

   Observations were made of battery grids and small parts casting, grid pasting and finishing, chemical sampling, battery assembly, final inspection, and the calibration status of production measuring tools and process control indicating and recording instruments.

   Review, also, included the following QC monitoring records, procedures, and specifications maintained in various manufacturing areas by the four QC Area Controllers: 10 QC procedures; 7 manufacturing requirements procedures; 3 quality characteristic lists specifications; 1 process specification; 8 weekly castings QC checklists; 10 plate pasting QC checklists; 10 weekly stationary inspection and process verification QC checklists; 4 weekly stationary product inspection reports; 10 weekly battery finishing and shipping QC checklists; 10 weekly small parts process QC checklists; and 6 (twice weekly) charging process QC checklists.

   Within this area, no nonconformances to NRC or QA program requirements were identified, and no unresolved items were identified.

2. Change Control: The inspector reviewed the QA Manual Section 3, "Design Documentation and Change Control," and Section 6, "Quality Documents, Preparation and Issuance Of," which were applicable to changes in engineering generated manufacturing documents, and QA and QC documents.

   A review was also made of: an administrative document control procedure QAP-55.0; two records of Engineering Change Notices requesting changes to manufacturing requirement procedures; one record of an Engineering Specification Notice; one Design Notice covering a change in a design drawing; and one record of a Purchase Specification Notice.

ORGANIZATION: EXIDE CORPORATION
RICHMOND, KENTUCKY

REPORT NO.: 99900359/82-01	INSPECTION RESULTS:	PAGE 6 of 6

Review and discussion also established that only the QC procedures and their changes, were totally generated and approved at the Richmond plant level. While changes to engineering, manufacturing, and QA documents may be requested at plant level using ECRs, the final approvals and changes are controlled at the Yardley and Horsham, Pennsylvania, engineering, quality assurance, and corporate levels.

Within this area, no nonconformances to NRC and QA program requirements were identified and no unresolved items were identified.

3. Nonconformances and Corrective Action: The inspector reviewed two sections of the Exide QA manual which were applicable to control and disposition of deficiencies found in materials at receiving inspection, parts during manufacture and assembly, and batteries during final inspection prior to shipping. This control of nonconforming items involved those items which could not be dispositioned during normal processing under the red tag system.

To verify that nonconforming items were reviewed and accepted, rejected, repaired, or reworked, and that conditions adverse to quality, including the cause were corrected, a review was made of: 2 administrative QA procedures; 10 Material Review Reports common to the GN (nuclear) type batteries; 4 Vendor Defective Material Reports; and 2 Corrective Action Requests.

Observations were made of four hold areas in the shop, designated for items on hold for the Material Review Board disposition.

Within this area, no nonconformances to NRC and QA program requirements were identified, and no unresolved items were identified.

ORGANIZATION: THE FOXBORO COMPANY
HIGHLAND PLANT
EAST BRIDGEWATER, MASSACHUSETTS

REPORT NO.: 99900225/82-01	INSPECTION DATE(S) 4/6-8/82	INSPECTION ON-SITE HOURS: 24

CORRESPONDENCE ADDRESS: The Foxboro Company
ATTN: Mr. C. A. McKay, Executive Vice President
Technology Division
38 Neponset Ave.
Foxboro, MA 02035

ORGANIZATIONAL CONTACT: Mr. F. Leathers, Corporate QA Manager, Field Operations
TELEPHONE NUMBER: (617) 543-8750

PRINCIPAL PRODUCT: Electronic Process Control Instrumentation and Allied Equipment.

NUCLEAR INDUSTRY ACTIVITY: The Highland Plant Nuclear production output is 2.5% based on sales.

ASSIGNED INSPECTOR: R. E. Oller — 5-27-82
R. E. Oller, Reactive & Component Program Section (R&CPS) — Date

OTHER INSPECTOR(S):

APPROVED BY: for I. Barnes — 5/27/82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: Status of previous inspection findings; manufacturing process control, and nonconformances and corrective action.

PLANT SITE APPLICABILITY: Not identified.

ORGANIZATION: THE FOXBORO COMPANY
HIGHLAND PLANT
EAST BRIDGEWATER, MASSACHUSETTS

REPORT NO.: 99900225/82-01	INSPECTION RESULTS:	PAGE 2 of 6

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Deviation A (80-01): Failure to revise the workmanship standard by January 1, 1978, to require a minimum of one and one-half thread protrusions for all nuts and bolts regardless of use or configuration. Also, failure to perform a minimum of four audits in 1978 for Department No. 704, to ensure that inspectors were doing a proper inspection job. Both of these actions were committed to in the Foxboro Company corrective action response letter dated October 14, 1977.

   The NRC inspector verified that in accordance with Foxboro's response letter dated May 9, 1980, Standard No. 14200A, Section 5.2, was revised, effective December 13, 1977, by the addition of the statement, "Screw extends past nut or retainer a minimum of 1½ threads, except when such projections interferes with the design function." Also, the Highland Plant procedure No. 54.72 "Nonconformance Reporting for Documentation Conflicts," was initiated on March 17, 1978 to provide preventive action.

   The NRC inspector also verified that Procedure No. 54.48, "Highland Mini-Audit Procedure," was revised on August 30, 1978, to change the audit frequency for all areas to twice annually.

   Review of current records of audit verified that Department 704, "Inspection," was audited during three quarters of 1981 to meet the revised procedure requirements.

2. (Closed) Deviation B (80-01): Failure to log all of the monthly preventive maintenance in the PMC schedule attached to the folder on the automatic sequencer machine, as required by Section D, paragraph II of the Operation and Maintenance Procedure No. 14100F dated March 1976.

   The NRC inspector verified that in accordance with Foxboro's response letter dated May 9, 1980, the log and the procedure are now under the computerized preventive maintenance operations control and are maintained in the PMO office. The sequencer machine now has a PMO "due date sticker" attached to it. The former Procedure No. 14100YF has been superseded by Plant Procedure No. 56.01, "Test Equipment Control, Calibration and Maintenance Department," effective February 23, 1982. This procedure provides department policy. The actual PMO for the sequencer machine is provided in Procedure "Tool No. 206079," which provides for PMO on a weekly basis. Review of audit records verified that the Sequencer Department was audited on October 2, 1981. Observations verified that a current weekly PMO sticker was attached to the sequencer.

3. (Closed) Deviation C (80-01): Failure to attach a maintenance checklist identifying the preventive maintenance, personnel performing it, and date of accomplishment, to the tool folder, for the automatic inserter machine as required by Section E, paragraph 2, of the Operations and Maintenance Procedure No. 14101BK, dated June 21, July 29, and 30, and August 2, 1976.

   The NRC inspector verified that in accordance with Foxboro's response letter dated May 9, 1980, this condition for the inserter machine was similar to that for the sequencer and the corrective and preventive actions were the same. The weekly PMO log and Procedure "Tool No. 206075" are maintained in the PMO office. The inserter has a currently weekly PMO sticker attached to it, and this department was also audited.

4. (Closed) Deviation D (80-01): Failure to place the "circle" inspection stamp at the applicable operation on four Production Routing Cards for items identified as "Okay for Stock," as required by Foxboro Procedure No. 52.2L, dated January 31, 1980, and QC Inspection Instruction No. 24100LQ, Revision B.

ORGANIZATION: THE FOXBORO COMPANY
HIGHLANDS PLANT
EAST BRIDGEWATER, MASSACHUSETTS

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The inspector verified that in accordance with Foxboro's response letter, dated May 9, 1980, QCII No. 24100LQ was revised on March 25, 1980, to clarify it and correlate it with procedure No. 52.2L by adding "It is not necessary to 'circle' stamp a final inspection operation if the 'OK for Stock' stamp is to be used." Review of records verified that four quarterly audits of this Department, No. 782, were performed during 1981 and 1982 to provide preventive action.

5. (Closed) Deviation E (80-01): Failure to adhere to the requirements of the QC&M Procedure No. 14100YB, Revision B, regarding the wave solder machine speed, calibration, nozzle pressure and temperature, and wave solder cleanliness sample boards had not been tested weekly.

   The inspector verified that in accordance with Foxboro's response letter dated May 9, 1980, a review by Foxboro determined that the wave solder machine settings were correct, as found, but the procedure had not been updated to reflect the new parameters. To correct this condition, Procedure No. 14100YB was revised, effective April 2, 1980, to provide the correct ranges of the parameters. The wave solder cleanliness sampling board tests were reinstated, and are being performed, as verified by weekly test records maintained in the chemical laboratory. Preventive action was provided by performing four audits of the chemical laboratory during 1981.

6. (Closed) Unresolved Item D.3.b (80-01): The available records in manufacturing process control did not indicate that Quality Control had monitored and reviewed all process tools and equipment used in manufacturing.

   The inspector determined that this audit activity is controlled by Procedure No. 54.44 "Manufacturing Process Monitor"; the QCII form No. 2400DA which delineates QC monitoring activities with regard to process tools and equipment, and the mini-audit record form. Review of audit record forms for the PM Department shows that Item 2 "Tools Calibration/Numbered/Maintained" was checked as acceptable. These records show the PMO Department No. 752 was audited twice a year on a quarterly basis.

7. (Closed) Followup Item D.4 (80-01): The manufacturing process control drawings in use in the cable area were not consistent in specifying overall cable lengths.

   Review of this matter during this inspection verified that the drawing in question, No. B0136EC, Revision B, contained directions for determining the overall cable length and the specific length did not need to be put on this drawing. Other drawings could have the specific lengths of cable identified on them depending on the application, or if specified by the "Highland Manufacturing Service Group," which makes up drawings used for custom requirements. This variation in identifying overall cable length, does not appear to constitute a problem.

E. OTHER FINDINGS OR COMMENTS:

1. Manufacturing Process Control: The inspector reviewed nine sections of the Highland Plant Quality Program Manual, Issue No. 8, which were applicable to parts manufacture, assembly and inspection of electronic process control instrumentation.

   Observations were made of the burn-in and inspection of integrated circuits, manufacture and inspection of printed circuit boards; automatic and manual insertion of components in the PCB's; first piece inspection; assembly and final inspection of instruments and power supply units, and the calibration and preventive maintenance status of manufacturing machines and process and inspection tools.

   To verify that parts, subassemblies and assembled instruments were controlled, assembled, inspected, tested and documented in accordance with the Quality Program, a review was made of: nine plant procedures; Shop Travel Cards (travelers) and/or Factory Operations (Long Form) sheets accompanying the processing of integrated circuits; insertion of components in PCB's, assembly of power supply units, first piece inspection of PCB's, and final inspection of completed instruments.

   Within this area, no nonconformances or unresolved items with respect to NRC and the Quality Program requirements were identified.

2. Nonconformances and Corrective Action: The inspector reviewed two sections of the Highland Plant Quality Program Manual which were applicable to the control and disposition of nonconformances found by inspections and tests in procured material and items, in-process parts, and final assembled instruments.

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To verify that nonconforming items were reviewed and accepted, rejected, repaired, or reworked, and that conditions adverse to quality, including the cause, are promptly identified and corrected, a review was made of: three plant procedures; records of eight MRB completed Nonconformance Action Requests common to procured items, and records of 10 MRB completed Nonconformance Reports common to deficiencies found in items in-process.

Observations were made of the area used for segregating non-conforming items pending MRB disposition, and the identification of the items by red tags.

Within this area, no nonconformances or unresolved items with respect to NRC and the Quality Program requirements were identified.

ORGANIZATION: GENERAL ELECTRIC COMPANY
WILMINGTON MANUFACTURING DEPARTMENT
WILMINGTON, NORTH CAROLINA

REPORT NO.: 99900003/82-01	INSPECTION DATE(S) 3/8-12/82	INSPECTION ON-SITE HOURS: 28

CORRESPONDENCE ADDRESS: General Electric Company
Wilmington Manufacturing Deparment
ATTN: Mr. J. A. Long, General Manager
P. O. Box 780
Wilmington, NC 28401

ORGANIZATIONAL CONTACT: Mr. C. W. Doyle, Quality Audits & Customer Service Mgr.
TELEPHONE NUMBER: (919) 343-5884

PRINCIPAL PRODUCT: Nuclear Fuel Assemblies and Core Hardware

NUCLEAR INDUSTRY ACTIVITY: Major nuclear fuel, control rod drive, jet pump, steam seperator, hydraulic control unit, and other BWR core hardware supplier for GE designed cores.

ASSIGNED INSPECTOR: W. M. McNeill 5/10/82
W. M. McNeill, Reactive & Components Program Section (R&CPS) Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes 5/10/82
I. Barnes, Chief, R&CPS Date

INSPECTION BASES AND SCOPE:

A. BASES: General Electric Topical Report NEDO-11209-04.

B. SCOPE: Procurement controls, cladding fabrication, fuel rod fabrication, and status of previous inspection findings.

PLANT SITE APPLICABILITY:

Not identified.

ORGANIZATION: GENERAL ELECTRIC COMPANY
WILMINGTON MANUFACTURING DEPARMENT
WILMINGTON, NORTH CAROLINA

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A. VIOLATIONS:

None

B. NONCONFORMANCES:

Contrary to Section 5 of the NRC approved Topical Report NEDO-11209-04 and paragraph 5.5 of Product/Process Quality Plan FCO 50.2, there was no Quality Notice or other data to document the temperature profile verification in 1981 for four of five autoclaves. There was no Quality Notice but there was data to document that temperature profiles were verified for three of the autoclaves in 1980.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Nonconformance (81-01): The applicable project code effectivity date was not included in a material requisition and its subsequent purchase order. A review of current purchase orders and material requisitions uncovered no further problem in this area. GE has revised its Code Manual to describe the order entry documents as the key source of code effectivity information.

2. (Closed) Nonconformance (81-02): Fluorine, chlorine, carbon, and nitrogen samples, used by the computer to calculate total impurities and boron equivalence, were not always drawn from the same material as the metal impurity sample for Gadolinium fuel. A review of current release lot found the samples drawn from the same tray of pellets. The Quality Control Instruction and the computer program have been revised to require samples to be drawn from the same tray.

E. OTHER FINDINGS OR COMMENTS:

1. Follow up on Unresolved Item - Verification of whether the material on Furnace Sheet 1573, which was suspected to have high hydrogen, had been placed on hold in the Manufacturing Information and Control System (MICS). GE found that it could not recall the historical information from its computerized MICS system. Computer inputs have now been coded as historical information. The recall of historical information on the acceptance ststus of a current lot was verified. This unresolved item is now closed.

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WILMINGTON, NORTH CAROLINA

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2. Procurement Controls - The procurement controls used on Kearsarge, an investment casting subvendor, were reviewed. Additional controls and inspection had been placed on Kearsarge before it discontinued business. Several purchase orders for various parts, such as velocity limiters and fuel supports, and their associated drawings and specifications, were reviewed. In addition, the surveillance reports and receipt inspection activities were reviewed. The nonconformances reported by Kearsarge to GE were verified to have been processed by GE in accordance with established procedures.

3. Cladding Fabrication - The specifications, drawings, and quality plans related to cladding fabrication were reviewed. The release of recent lots of cladding was inspected. The results of chemical and physical testing were verified to be in conformance with the specications and quality plans requirements. The processing of cladding, in particular, autoclaving and annealing were inspected. The qualification of the processes and personnel was verified and the conformance of the processes to specifications and quality plans was verified. In this area, one nonconformance was identified. Before the end of the inspection, GE began the corrective action of performing an autoclave thermocouple run.

4. Fuel Rod Fabrication - The fuel design documents, specifications, drawings, and etc., were reviewed. The personnel and station qualifications were verified. The welding of plugs to fuel clad was witnessed. In such, the conformance to specification and procedure requirements was verified.

ORGANIZATION: GENERAL ELECTRIC COMPANY
NUCLEAR ENERGY BUSINESS OPERATIONS
SAN JOSE, CALIFORNIA

REPORT NO.: 99900403/82-01	INSPECTION DATE(S) 2/22-26/82	INSPECTION ON-SITE HOURS: 58

CORRESPONDENCE ADDRESS: General Electric Company
Nuclear Energy Business Operations
ATTN: Mr. W. H. Bruggeman
Vice President and General Manager
175 Curtner Avenue
San Jose, California 95125
ORGANIZATIONAL CONTACT: Mr. A. Breed, Manager, Quality Assurance
TELEPHONE NUMBER: (408) 925-2726

PRINCIPAL PRODUCT: Nuclear Steam System Supplier

NUCLEAR INDUSTRY ACTIVITY: General Electric Company, Nuclear Energy Business Operations (NEBO), has a work force of approximately 7650 people with approximately 98% of that work force devoted to domestic nuclear activity. NEBO currently has 26 reactor units under construction and 4 reactor units under contract. NEBO also has approximately 115 service contracts with various clients.

ASSIGNED INSPECTOR: C J Hale /for 5/26/82
D. D. Chamberlain, Reactor Systems Section (RSS) Date

OTHER INSPECTOR(S): W. E. Foster, Reactive & Components Program Section

APPROVED BY: C J Hale 5/26/82
C. J. Hale, Chief, RSS Date

INSPECTION BASES AND SCOPE:

A. BASES: General Electric Topical Report No. NEDO-11209-04A and 10 CFR Part 50, Appendix B.

B. SCOPE: See next page.

PLANT SITE APPLICABILITY: Docket Numbers 50-416/417, 50-466/467, 50-556/557, 50-461/462, 50-367, 50-354/355, 50-410, 50-440/441, 50-458/459, 50-522/523, 50-373/374, 50-373/374, 50-466/467, 50-553/554, and 50-518/519/520/521.

ORGANIZATION: GENERAL ELECTRIC COMPANY
NUCLEAR ENERGY BUSINESS OPERATIONS
SAN JOSE, CALIFORNIA

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B. SCOPE: Status of previous inspection findings and follow up on the following requests:

1. Allegations that General Electric (GE) San Jose had sent technical publications to licensees containing known errors.

2. Region III request regarding potential document control problems at GE (LaSalle project).

3. 10 CFR Part 50.55(e) report (River Bend project) stating that the heat loads provided by GE to Stone & Webster (S&W) for sizing the heating and ventilating (HVAC) system in the high pressure coolant injection (HPCI) system diesel generator room were about one-third of the expected value.

4. 10 CFR Part 50.55(e) report (TVA) stating that GE was not performing 50.55(e) evaluation of potential reportable conditions as required.

Additionally, this inspection was conducted as a result of Mississippi Power and Light Company's issuance of 10 CFR Part 50.55(e) reports pertaining to (1) inadequate circuit separation in Power Generation Control Complexes (PGCC), (2) incorrect assembly of PGCC cable connectors, (3) termination of size 8 AWG and smaller wire in junction boxes of PGCC termination cabinets, (4) inability to adjust transmitters and trip units for the reactor vessel water level scrams, (5) improper contact arrangement of Series 20, Type PR-20 Electro Switch, and (6) incompatibility between design documents and termination cabinets. Items (5) and (6) were partially evaluated during a previous inspection. All items refer to hardware supplied to the Grand Gulf Nuclear Generating Station.

ORGANIZATION: GENERAL ELECTRIC COMPANY
NUCLEAR ENERGY BUSINESS OPERATIONS
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A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Section 5 of Topical Report No. NEDO-11209-04A, Revision 3, dated August 1981, and paragraph 5.1 of Fire Test Specification No. A00-626 (Design Record File No. A00-794-6), the final test report for the fire test had not been signed by the performer.

   Prior to the close of this inspection, the inspector was provided a copy of a letter that gave an interpretation of the headings identified on the test report cover sheet. Additionally, the test report cover sheet was modified by adding a heading entitled "Performed By". This heading was completed by the typed name and signature of the performer and the date.

   Since corrective and preventive actions were taken before the end of the inspection, no further written response is required.

2. Contrary to Section 5 of Topical Report No. NEDO-11209-04A, Revision 3, dated August 1981, and paragraph 5.3.3 of Manufacturing Standard Practice (MSP) No. 10.003, Revision 3, dated February 26, 1981, Section 14 of the Power Generation Control Complex Cable Assembly Instruction Manual had not been released to the station where the specified task (connector preassembly) was being accomplished.

   The above paragraph of MSP 10.003 indicated that individual sections may be released to the floor for use in cable manufacturing. It was apparent that responsible individuals elected to release sections to the floor, as evidenced by appropriate sections at work stations.

Prior to the close of this inspection, the inspector was provided a copy of a letter and its attached Corrective Action Request, a sample Surveillance Program Check Sheet, and an "Advanced Copy" of MSP No. 10.003, Revision 4, dated February 25, 1982.

Since corrective and preventive actions were taken before the end of this inspection, no further written response is required.

3. Contrary to Section 5 of Topical Report No. NEDO-11209-04A, Revision 3, dated August 1981, and paragraph IV.B of Nuclear Energy Business Group Procedure No. 70-42, Revision 4, dated March 27, 1981, requested additional information, or a schedule for such information, had not been provided within 5 working days after receipt of the request. The request was made to Quality Assurance in a memorandum, dated May 27, 1981, with a required response date of June 5, 1981. The memorandum transmitting the requested information was dated June 26, 1981. The date that Quality Assurance received the memorandum of May 27, 1981, is not verifiable because it was not date stamped upon receipt. However, it was received prior to June 5, 1981, as evidenced by its (subject matter/PRC No.) inclusion in a Quality Assurance status report dated June 5, 1981.

4. Contrary to the requirements of 10 CFR Part 50, Appendix B and procedure EOP 30-10.00 Section 1.6, no Engineering Review Memorandum (ERM) existed to document the required reviews of GEK-75662A - Clinton 1 - Operation and Maintenance Instructions - High Pressure Core Spray System.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

(Closed) Nonconformance (81-03): Material Requests (MRs) for safety-related components were not being accomplished and controlled by established procedures and standing instructions.

Quality Control Standing Instruction (QCSI) 7.2.18 and Engineering Operating Procedure (EOP) 42-5.00 were revised to strengthen and clarify program requirements for tracking, review, and filing of MRs and Purchase Orders (P.O.). Also, an internal management memo was directed to all QC Engineers concerning the need for strict compliance with QCSI 7.2.18 regarding MR/PO control.

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E. OTHER FINDINGS OR COMMENTS:

1. Technical Publications to Licensees Containing Known Errors - This area of inspection resulted from a Region V request for follow up at GE on allegations regarding technical publications, containing known errors, being sent to licensees. The concerns related to Operation and Maintenance (O&M) Instruction Manuals for GE supplied systems. Applicable procedures were examined to determine program requirements relative to O&M manuals. The following documents were examined in order to verify implementation of the program requirements: a typical list of standard NSSS O&M instruction manuals; nine issued O&M manuals; and four Engineering Review Memoranda which document the required engineering review of the O&M manuals. The review ranged from a spot check (for such things as control rod drive voltages) of the issued O&M manuals against the draft copy that was reviewed by engineering to a word for word proofreading of 20 randomly selected pages of O&M manual GEK-7577, Grand Gulf 1 and 2, Operation and Maintenance Instructions, Fuel Handling Platform. Problems identified from the review were as follows:

   a. No ERM existed to document the required review of one manual. A nonconformance was issued for this item (see item B.4 above).

   b. The issued copy of Manual GEK-75662A did not include three lines on one page examined. The missing lines were a description of certain automatic fault lock-out conditions for the fuel handling platform operation.

   GE procedures require that between initial Operation and Maintenance Instruction Manual distribution and plant turnover, or a date agreed upon by the project office, necessary changes will be made to the manuals via errata and addenda. At the time of plant turnover, or a date agreed upon by the project office, the manual will be reviewed for required corrections and issued. Therefore, any errors detected would be corrected during the final issue. The O&M manuals are based on approved and verified design documents and contain copies of selected design documents and the O&M manuals require engineering review and approval. The O&M manuals for safety-related equipment are very similar from project to project, therefore, the same technical information receives many reviews during project completion. It appeared that GE was encountering some problems with typographical errors on recent draft manuals due to typing of an entire manual for the first time on a word processing machine. However, there was no evidence to indicate that the manuals were being issued with a large number of typographical errors or being issued with known errors. This item is considered closed with respect to concerns regarding GE issuing O&M manuals with known errors.

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2. Potential Document Control Problems at GE (La Salle project) - During a Region III project specific (La Salle) inspection of GE, discrepancies were identified relative to the reference document revision numbers listed in GE Design Report 22A7431, Main Steam Piping and Equipment Loads, and the document revision numbers listed in computer printouts and in the GE Engineering Information System (EIS). The EIS is a computer listing of GE design documents which shows the latest revision status. The design report noted was a stress report and the report was certified to the applicable revisions of input documents on December 15, 1981. The reference documents noted in the design report were revised, but the revisions had no effect on the results. Three additional design reports were examined and certain reference documents were compared to the EIS computer printout. No discrepancies were identified. Since a certification of stress reports is required for applicable input documents, the one case noted where the reference documents list did not indicate the latest revision is not considered a problem. This item is considered closed.

3. 10 CFR Part 50.55(e) From River Bend Project - This area of inspection resulted from a 10 CFR Part 50.55(e) report from the River Bend project stating that the heat loads provided to S&W by GE for the sizing of HVAC in the HPCI diesel generator room were about one-third the actual values. An S&W engineer apparently questioned the values of heat radiation provided. GE had provided S&W with heat load values in a specification for preliminary sizing of HVAC equipment. The diesel generator was supplied by Stewart and Stephenson (S&S) and values of heat radiation were indicated in an operation manual. When S&W questioned the values provided, GE contacted S&S and an S&S engineer provided a memo with a revised value which was about three times the preliminary GE value and the value provided by the S&S manual. No explanation was given for the higher value or the original value. GE is presently evaluating this item as a potentially reportable condition and apparently no final value has been provided to S&W. Morrison Knudsen also provides HPCI diesel generators to GE and their heat load value was also lower (about one-third to one-half) than the latest value provided by S&S. GE stated that the following sites could be affected; La Salle, Nine Mile Point 2, Perry, Clinton, River Bend, Hanford, Grand Gulf, Allens Creek, TVA (all), Skagit, and Black Fox. This item will remain open pending further review at S&W, S&S and GE.

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4. 10 CFR Part 50.55(e) From Hartsville Project - This area of inspection resulted from a 10 CFR Part 50.55(e) report for Hartsville and Phipps Bend (TVA) stating that GE has not been advising TVA of GE initiated potentially reportable conditions (PRC's) or of GE or C. F. Braun initiated STRIDE Design Deficiency Reports (SDDR's) and that GE has not been evaluating these PRC's and SDDR's for reportability in accordance with 10 CFR Part 50.55(e). Upon review of this item, it was noted that an NRC staff meeting was held on December 10, 1981, at the request of GE, to discuss how 10 CFR Part 50.55(e) data is being applied to non-licensee organizations. GE was advised by the NRC staff that the Construction Permit (CP) holder must assure, through instructions to his contractors, that he is informed of matters reportable under 50.55(e) and that the CP holder and his contractor must decide on whether contract requirements on this issue are being satisfied. GE's present method is to evaluate both deficiencies and deviations under 10 CFR Part 21 criteria and once a condition is determined not to be reportable under Part 21, the licensee is not notified of the condition. As a result of the December 10, 1981, meeting, the NRC staff informed GE that additional guidance regarding the subject would be issued, probably in the form of an Information Notice.

   GE procedures EOP 65-4.00 (Potentially Reportable Conditions) and Group Procedure 70-42 (Reporting of Defects and Noncompliance Under 10 CFR Part 21 or Part 50.55(e)) were reviewed and they provide the necessary control for GE to meet their reporting requirements to the NRC. This item is considered closed with respect to concerns regarding GE reporting requirements to the NRC.

5. Status of Previously Inspected Items:

   a. Electro Switch, Series 20, Type PR-20 - Investigative activity is continuing. An action item has been assigned to Quality Assurance and identified in an internal letter. The action item indicates that Quality Assurance should

(1) verify that switches with mirror image contacts had not been shipped to other users, and (2) determine how an improperly configured switch was shipped to the user. This item remains open and will be evaluated during a future inspection.

b. Incompatibility of Design Documentation with Shipped Termination Cabinets - The inspector was informed that this deficiency occurred due to lack of control of test assemblies, i.e. changes were made to the test assemblies as a result of changes in cable ladders and termination points during the staging activity. Currently, test assemblies are subjected to the same design control measures as deliverable hardware. This practice was instituted prior to complete shipment of hardware for Grand Gulf 1. The problem appears isolated to the Grand Gulf Nuclear Generating Station. It should be noted that test assemblies are substitutes for the termination cabinets which are shipped about a year prior to the staging activity at the factory. The inspector was informed that incorporation of checklists into design record files was a separate and unrelated issue regarding incompatibility of design documentation with shipped termination cabinets.

A review of contractual documents failed to reveal a requirement for supplying "as shipped" drawings. Design record files were reviewed for incorporation of checklists. Checklists had been incorporated and reflected design verification. Actions related to this area of the inspection appear adequate. This item is closed.

6. 10 CFR Part 50.55(e) Reports From Mississippi Power and Light Company (MP&L Co.).

a. Concerning inadequate circuit separation in the Power Generation Control Complexes (PGCC) at the Grand Gulf Nuclear Station, Units 1 and 2 (GGNS 1 & 2), the inspector was informed that:

(1) The exact cause of the problem had not been identified;

(2) Reg Guide 1.75 and IEEE 384 became effective at or near completion of the design phase of the PGCC for GGNS, Unit 1; and

(3) Available talent perceived that the wiring complied with the requirements. Continuous education and evaluation revealed this perception to be in error. Fire test specification, fire test report calculations, and other pertinent data for these analyses and tests had been incorporated into Design Record File No. A00-794-6. A review of this file and other related information indicated that adequate corrective action had been taken or planned.

During the review, it was noted that a test report did not contain the signature of the performer as required by the test specification. This was documented as a nonconformance. (See B.1 above). Prior to the close of this inspection, the inspector was provided a copy of a letter that gave an interpretation of the headings identified on the test report cover sheet. Additionally, the test report cover sheet was modified by adding a heading entitled "Performed By." This heading was completed by the typed name and signature of the performer and the date. Since corrective and preventive actions were taken, no further response is required.

b. Concerning incorrect assembly of cable connectors on PGCC cables for GGNS1, the MP&L Co. final report dated June 12, 1981, indicated that the deficiency was not reportable; however, the inspector elected to evaluate actions taken. The inspector (1) observed preassembly of cable connectors and pin insertion, and (2) reviewed inspection records and special study test data. While observing pin insertion, it was noted that the work bench contained four disassembled connectors. The inspector inquired as to the method used for assuring that reassembly was correct and was advised that this practice would be evaluated. While observing connector preassembly it was noted that the appropriate section of the PGCC Cable Assembly Instruction Manual had not been issued to the work station. This was documented as a nonconformance (see B.2 above). Corrective and preventive actions were taken prior to the close of this inspection; no further response is required.

This item is considered closed.

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NUCLEAR ENERGY BUSINESS OPERATIONS
SAN JOSE, CALIFORNIA

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c. Concerning termination of size 8 AWG and smaller wire in junction boxes of PGCC termination cabinets supplied for GGNS 1 and 2, the MP&L Co. final report, dated August 10, 1981, indicated that the deficiency was not reportable; however, the inspector elected to evaluate actions taken. An unmounted junction box terminal block with attached sizes 8 AWG and 14 AWG wires was observed, as well as an actual installation in a remote shutdown vertical board. Also, drawings and manufacturing standard practices governing assembly were reviewed. All appeared in order and this item is considered closed.

d. Transmitters and trip units for reactor vessel water level scrams supplied for GGNS 1 can not be adjusted to the specified setting. The Potentially Reportable Condition File, No. 81-23 contained (1) an internal memorandum, dated April 20, 1981, which provided explicit details of the problem, and (2) a memo of telecon, dated August 19, 1981, which announced verbal notification to the Commission. It was not apparent, from reviewing the file, that further evaluation was underway from April 20 to August 19, 1981; however, it was apparent that the written report to the Commission, dated August 19, 1981, contained no information significantly different from that contained in the internal memorandum, dated April 20, 1981. The file indicated the following activities were underway from April 20 to August 19, 1981: (1) identification of the cause of the problem; (2) extent of the problem, and (3) correction of the cause. Information in the file indicated the problem was the misapplication of equipment caused by "an engineering mistake in choosing the transmitters to be used."

During the exit interview, exception was taken to the NRC inspector's observations regarding the length of time between awareness and reporting of the problem.

It was noted that additional information (requested by the Manager of Safety and Licensing from Quality Assurance), regarding transmitters and trip units for reactor vessel water level scrams, had not been provided within the time required by NEBG Procedure No. 70-42. This was documented as a nonconformance (see B.3 above).

ORGANIZATION: GIBBS & HILL, INC.
NEW YORK, NEW YORK

REPORT NO.: 99900524/82-01	INSPECTION DATE(S) 2/22-26/82	INSPECTION ON-SITE HOURS: 26

CORRESPONDENCE ADDRESS: Gibbs and Hill, Inc.
ATTN: Mr. P. P. DeRienzo, Vice President
Quality Assurance
393 Seventh Avenue
New York, New York 10011

ORGANIZATIONAL CONTACT: Mr. N. N. Keddis, QA Manager
TELEPHONE NUMBER: (212) 760-5450

PRINCIPAL PRODUCT: Architect Engineering and Consulting Services

NUCLEAR INDUSTRY ACTIVITY: The total effort committed to domestic nuclear design activities is approximately 23% of the 2,000 employees of Gibbs & Hill, Inc., at their New York facilities. Major projects include the design of Comanche Peak, Units 1 and 2; Three Mile Island, Unit 1, FSAR update; Beaver Valley, Unit 1, equipment update, and Bellefonte, Unit 1, design studies.

ASSIGNED INSPECTOR: C. J. Hale for — 4-14-82
D. F. Fox, Reactor Systems Section (RSS) — Date

OTHER INSPECTOR(S):

APPROVED BY: C. J. Hale — 4-14-82
C. J. Hale, Chief, RSS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and the PSAR and FSAR for the Comanche Peak Steam Electric Station (CPSES), Units 1 and 2.

B. SCOPE: This inspection was made as a result of the issuance of a 10 CFR Part 21 report by Gibbs & Hill pertaining to an analysis of the Tornado Venting System for the Comanche Peak Steam Electric Station. Additional areas included in the inspection were status of previous inspection findings and design inspection of safe shutdown capability following high and moderate energy line breaks outside containment.

PLANT SITE APPLICABILITY: Comanche Peak Steam Electric Station, Units 1 and 2, Dockets 50-445 and 50-446; Fort Calhoun, Unit 1, Docket 50-285.

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NEW YORK, NEW YORK

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A. VIOLATIONS:

None.

B. NONCONFORMANCES:

None.

C. UNRESOLVED ITEMS

None.

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

(Closed) Nonconformance (81-04): Contrary to CPSES project procedure DC-5, certain of the changes made in Revision 3 of specification 2323-MS-46A were not identified nor design reviewed, as required.

Specification 2323-MS-46A was revised on February 2, 1982, (via DE/CD S-2564) to identify, with line bars and revision numbers, the previously unidentified changes that were made to Revision 3 of the specification. The revised specification was design reviewed on February 23, 1982. Procedure DC-5 was being revised to delete the requirement that design reviews be performed on the edited and finished typed document and permit the design review to be performed on a draft version of the document. The design review would be performed in parallel with the interdisciplinary reviews of the document. The originating discipline would be responsible for assuring that all significant changes made to the draft were design reviewed prior to issue of the document. Gibbs and Hill management stated that the revised procedure will be issued during the first quarter of 1982.

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NEW YORK, NEW YORK

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E. OTHER FINDINGS OR COMMENTS

1. 10 CFR Part 21 Report Inspection - Review of available documentation, and interviews with cognizant personnel, indicate that the original (February 11, 1977) CPSES tornado venting system pressure and air flow analyses was not sufficiently detailed so as to determine if the pressure differential across interior walls, doors, glass panels, electrical equipment cabinets, etc., would exceed the design allowable in the event of a design basis tornado (DBT).

   The original calculation assumed that the interior of the turbine, auxiliary, safeguards, fuel handing and electrical and controls buildings of the CPSES was divided into approximately 25 "fire zones" and determined the venting area necessary to assure that the maximum differential pressure (DP) between any two contiguous volumes (zones), or to the atmosphere, did not exceed the design allowable (DA) of 1.5 PSI. The analysis is currently being redone using the COMPARE computer code. The affected buildings are assumed to be divided into 95 interior volumes with 163 interconnecting air flow paths. The status (open and closed) of over 400 interior doors is being considered in the analysis. The preliminary results indicate that approximately 15% of the DPs exceed the DA by over 10% and that approximately 5% of the DPs exceed the DA by over 40%. The results of the calculation are being transmitted to the affected disciplines for the evaluation of the effect of the increased DPs and air mass flow rates on their designs and air handling systems. G&H stated that the calculation should be completed by March 26, 1982, and that all required design corrective actions will be completed during 1982.

   The inspector noted that the validity of the analyses is dependent upon the status of approximately 246 doors within the identified buildings. Some of the doors are assumed to be held open (or closed) during a DBT by a locking mechanism. The status of certain other doors during a DBT must be assured by administrative control. Further, many of the doors and their associated hardware are being procured as architectural doors and as such are only capable of withstanding a DP of from 0.3 to 0.8 PSI depending upon the direction of the applied loading. G&H stated that this concern will be addressed during the design corrective action phase of the program.

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Unit 1 of the Fort Calhoun nuclear power station was also designed by G&H. Detailed design records were not available at G&H for examination by the inspector. G&H management stated that they informed the Omaha Public Power District (OPPD) of the situation prior to October 8, 1981. Action taken on this item by OPPD could not be determined from the documentation available at G&H.

This item will be followed during future inspections.

2. Design Inspection - Branch Technical Position Papers and sections of the CPSES Units 1 and 2 FSAR pertaining to postulated piping failures in fluid systems and accident analyses, were reviewed to determine the commitments, design bases, and design measures employed by G&H to assure that the nuclear power station can be safely shut down in the event of the postulated rupture of any high or moderate energy line outside of the reactor containment.

One technical report, 2 analytical models, 22 drawings and figures, 7 calculations, 2 design verification records, and other related documentation were examined by the NRC inspector to verify implementation of commitments.

The NRC inspector determined that some of the subcompartment temperature and pressure analyses performed to date do not appear to support the conclusion that no essential system or component required for safe plant shutdown is rendered incapable of performing its necessary functions as a result of any postulated pipe rupture.

This area will be inspected further during subsequent inspections.

ORGANIZATION: ITT GRINNELL INDUSTRIAL PIPING, INCORPORATED
KERNERSVILLE, NORTH CAROLINA

REPORT NO.: 99900019/82-01	INSPECTION DATE(S) 3/16-18/82	INSPECTION ON-SITE HOURS: 52

CORRESPONDENCE ADDRESS: ITT Grinnell Industrial Piping, Incorporated
ATTN: Mr. A. K. King
President
P. O. Box 566
Kernersville, NC 72284

ORGANIZATIONAL CONTACT: I. E. Johnson
TELEPHONE NUMBER: (919) 996-6400

PRINCIPAL PRODUCT: Nuclear piping subassemblies.

NUCLEAR INDUSTRY ACTIVITY: Not obtained during this inspection.

ASSIGNED INSPECTOR: J Barnes for H. W. Roberds, Reactive & Component Program Section (R&CPS) 5-6-82 Date

OTHER INSPECTOR(S): J. T. Conway, R&CPS

APPROVED BY: J. Barnes I. Barnes, Chief, R&CPS 5-6-82 Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made as a result of: (1) the detection of mechanical enhancement of the specified penetrameter 4-T hole images in Midland, Unit 1 piping weld radiographs; (2) the detection at Midland, Units 1 and 2, of cracks in Type 316 stainless steel piping subassembly welds; and (3) the identification that fittings in piping subassemblies furnished to Phipps Bend, Unit 1, and Hartsville, A and B, had been tested
(cont. on next page)

PLANT SITE APPLICABILITY: Penetrameter 4-T hole image enhancement - Docket Nos. 50-518/50-519/50-520/50-521 and 50-329. Incorrect Fitting NDE Method - Docket Nos. 50-518/50-519/50-520/50-521 and 50-553. Type 316 stainless steel weld cracks - Docket Nos. 50-329/50-330.

ORGANIZATION: ITT GRINNELL INDUSTRIAL PIPING, INCORPORATED
KERNERSVILLE, NORTH CAROLINA

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SCOPE: (Cont.) by the ultrasonic method and not by the required liquid penetrant or magnetic particle test method.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section V, Article 2 of the ASME Code, radiography of pipe welds with wall thickness of less than ½ inch was not performed with a technique of sufficient sensitivity to display the penetrameter image and the specified T hole for certain piping assemblies furnished to Midland, Unit 1, and Hartsville, Unit A and B. A review of radiographs at the Midland site and by NRC personnel at the ITT Grinnell, Kernersville plant, identified that certain radiographs had been mechanically altered to include an artificial representation of the specified 4-T hole of the penetrameter.

2. Contrary to Criterion V of Apppendix B to 10 CFR Part 50 and Section III of the ASME Code, paragraph NA-4370, documentation was not made available to the NRC inspector which would indicate corrective action requirements had been extended to a subcontractor, who had examined fittings by the ultrasonic method instead of the required liquid penetrant or magnetic particle method.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

(Open) Deviation (Inspection Report 80-01): Copies of forms to be used in resolution of Design Specification conflicts were not being sent to the Director of Quality Assurance, as required by corrective action commitments.

This subject was not addressed during the current inspection.

ORGANIZATION: ITT GRINNELL INDUSTRIAL PIPING, INCORPORATED
KERNERSVILLE, NORTH CAROLINA

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E. OTHER FINDINGS OR COMMENTS:

1. Nuclear Regulatory Commission, Region III, Referral of Penetrameter 4-T Hole Image Enhancement on Radiographs of Piping Welds Fabricated by ITT Grinnell

   a. This inspection was performed concurrently with an investigation by the Region IV Investigation and Enforcement Staff. Investigative findings are contained in Report No. 99900019/82-02.

   b. It was discovered that some radiographs of Class 2 pipe welds fabricated by ITT Grinnell (ITT-NC) for Midland, Unit 1, and Hartsville, Units A and B, had been mechanically altered to include an artificial representation of the specified 4-T hole of the penetrameter. The altered radiographs appear to be limited to pipe that is less than ½ inch wall thickness and where the radiographic technique used required the penetrameter selection be based on the single wall thickness of the pipe. As the result of an investigation by the NRC Region IV office, it was established that radiographs had been altered, on occasion, for approximately 6 years. The method of alteration to the radiograph consisted of enhancing the image of the applicable penetrameter T-hole with a lead pencil, thereby, making unacceptable or questionable quality radiographs appear to be acceptable when examined under normal viewing conditions.

2. Nuclear Regulatory Commission, Region II Referral of Fittings (Incorrect NDE) on Spool Pieces Fabricated by ITT-NC - A detailed review of the documentation (e.g., purchase orders, manuals, procedures, specifications, travelers, nonconformance reports, etc.) relating to the purchase, fabrication and examination of the forged fittings (both 12" and 20" O.D.) led to the following findings:

   a. Specific requirements (e.g., chemical, mechanical, NDE, etc.) were contained in TVA's purchase order to ITT for the spool pieces. Although ITT-NC referenced the code, three ITT specs, and two ANSI standards in the purchase orders for the fittings to their supplier, ITT-Grinnell of Princeton, Kentucky (ITT-KT), the specific test and inspection requirements were not addressed. In addition, there was no evidence that ITT-NC procurement documents required ITT-KT to provide an acceptable quality assurance program. (These apparent omissions have been corrected on current purchase orders).

b. QC personnel at ITT-NC perform receipt inspection to verify that the items meet purchase order requirements. Negative findings result in the generation of a nonconformance report, and the suspect item goes to a segregated storage area to await disposition. Contrary to the above, there was no evidence that a nonconforming report had been generated to reflect the fact that a number of fittings were not meeting purchase order requirements in the area of NDE.

c. There was no evidence that an adequate indoctrination and training program was established for personnel performing receipt inspection to assure that they were adept in performing quality affecting activities.

d. There was no evidence that nonconformance reports are periodically analyzed by the QA organization to show quality trends with the subsequent results reported to upper management for their review and assessment.

e. ITT-NC and TVA have reached a mutual agreement as to the disposition of the affected spool pieces containing the nonconforming fittings. Some of the spool pieces have been received and inspected by ITT in accordance with the original inspection requirements. The remaining spool pieces in question will be sent to ITT for reinspection in the near future.

3. Midland Type 316 Stainless Steel Piping Weld Cracks - A detailed review of the documentation (e.g., reports, procedures, specifications, travelers, qualification records, etc.) relating to the fabrication and examination of the type 316 stainless steel pipe spool pieces (10" and 12" sizes) containing cracks in the girth welds led to the following findings:

a. After field surface grinding of welds in preparation for inservice inspection, liquid penetrant examination revealed circumferential linear indications in 20 welds. The welds were performed by the same individual, and the cracks were confined to a single surface pass made by the submerged metal arc welding process.

b. The Materials & Quality Services Dept. of Bechtel performed a metallurgical investigation (Ref. report BLN No. 1279-10) of one weld and determined that the linear cracks were due to: (1) high restraint in the weld pass; (2) low delta ferrite in weld metal; and (3) unfavorable shape of weld bead.

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KERNERSVILLE, NORTH CAROLINA

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c. ITT's Research Development and Engineering Division concluded (Ref. report no. 2998) that the " . . . defect indications will not affect . . . the integrity levels applicable to the Class 1 and Class 2 piping systems."

d. NRC inspection of this defect condition did not identify any nonconformance with the welding requirements of Section III of the ASME Code. No documented evidence was made available, however, which would indicate actions had been taken to preclude or minimize occurrence of this type of defect; e.g., changes in weld process controls to reduce base material dilution. This item will be further reviewed during a future inspection.

e. All the welds containing linear liquid penetrant indications will be repaired in the field by Babcock & Wilcox using Bechtel procedures, standards, and specifications which were concurred in by ITT-NC.

ORGANIZATION: ITT GRINNELL,
PIPE HANGER DIVISION,
ENGINEERING DEPARTMENT
PROVIDENCE, RHODE ISLAND

REPORT NO.: 99900285/82-01	INSPECTION DATE(S) 2/9-12/82	INSPECTION ON-SITE HOURS: 27

CORRESPONDENCE ADDRESS: ITT Grinnell
Pipe Hanger Division
ATTN: Mr. D. M. Sewell
Division QA Manager
621 Dana Avenue
Warren, OH 44481

ORGANIZATIONAL CONTACT: Mr. D. M. Sewell, Division QA Manager
TELEPHONE NUMBER: (216) 373-1500

PRINCIPAL PRODUCT: Component Supports

NUCLEAR INDUSTRY ACTIVITY: Approximately 65% of ITT Grinnell's work is devoted to the commercial nuclear industry.

ASSIGNED INSPECTOR: _____ 5/5/82
L. E. Ellershaw, Reactive & Components Program Section (R&CPS) Date

OTHER INSPECTOR(S):

APPROVED BY: _____
I. Barnes, Chief, R&CPS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was conducted as a result of: (1) receipt of a potential construction deficiency report (CDR) from Southern California Edison Company pertaining to the use of washers other than hardened steel washers; (2) a CDR from TVA pertaining to linear indications being found in hanger material; (3) two CDRs from Duke Power Company pertaining to the

PLANT SITE APPLICABILITY:

Docket Nos: 50-361; 50-362; 50-438; 50-439; 50-413; 50-267.

ORGANIZATION: ITT GRINNELL
PIPE HANGER DIVISION
ENGINEERING DEPARTMENT
PROVIDENCE, RHODE ISLAND

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SCOPE: (cont.) use of a riser clamp fabricated by an unapproved vendor and a snubber extension piece being welded off center; (4) a regional request related to incorrect torque requirements resulting in snubber threads being stripped; and (5) items requiring further inspection identified during our inspection at ITT Grinnell, Warren, Ohio.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

Contrary to Criterion V of Appendix B to 10 CFR Part 50 and QA Manual Section 4.2, verification in accordance with the requirements of product drawings was not performed, in that the product drawings specified the use of carbon steel washers in Mechanical Shock Suppressors, Figures 306 and 307, but brass washers were actually used.

C. UNRESOLVED ITEMS:

ITT has used a material for rivet manufacturing which has not been approved by the ASME Code. Approval is pending (see paragraph D.1.).

D. OTHER FINDINGS OR COMMENTS:

1. Follow Up Inspection Item - The use of a riveted construction for the ITT PE-41 Series Pipe Clamp rather than a welded or bolted construction, was an item that had been inspected at ITT's Warren, Ohio, facility (Vendor Program Branch Inspection Report 99900282/81-01). However, certain data could not be substantiated at that time, insofar as this data is maintained at ITT, Providence, Rhode Island, and would be reviewed during an inspection at that facility.

   ASME Code, Section III, Subsection NF, imposes mandatory Appendix XVII for the analysis procedure to be followed, unless design is accomplished by use of either the experimental stress analysis procedure, or the load rating procedure. If Appendix XVII is used, the supports are required to be of a welded, bolted, or welded and bolted construction. Fabrication of component supports is also required to comply with the provisions of Article NF-4000, which addresses welded and bolted construction only.

The inspector reviewed the Load Capacity Data Sheets (LCDS), Revision 0, dated June 1, 1980, and Revision 1, dated June 9, 1980. Revision 0 did not list the rivets and showed that design had been accomplished by analysis. In addition, it did not list the required Level A and B, Level C and Level D maximum load pounds. Revision 1 added the levels and maximum load pounds, but still did not address rivets, and continued to show use of linear analysis.

Review of LCDS, Revision 2 dated January 30, 1981 showed that ITT used the load rating procedure in lieu of analysis, and that the ASME Code classification is Class 1, 2, 3, and MC. The LCDS identifies the rivet material as being SA 453 Grade 660, Condition A or B.

Revision 3 and 4 of the LCDs, dated August 1 and October 29, 1981, respectively, both reflect a change in material designation for the rivets to AMS 5737. This is asterisked, with a note stating, "Pending approval of Code Case N-71-11 and N-249-2."

At the time of this inspection, approval had not been obtained from ASME for the use of this material; therefore, this item is considered unresolved.

The following is a brief synopsis of how this problem occurred. All rivet material was ordered to SA 453 Grade 660, which is a bolting specification. The drawings provided to the rivet manufacturer also state SA 453 Grade 660. In addition, the drawings require dimensions to be in accordance with NAS 1199, a National Aerospace Standard, titled "Rivet-Solid-100° Flush Head A286 Corrosion Resistant Steel." NAS 1199 and SA 453 both specify a solution and precipitation heat treatment, but the times at temperature are different. The rivet manufacturer used the heat treatment specified by NAS 1199, because it is a rivet specification. The rivet manufacturer's material test reports show the material as being SA 453 Grade 660, A 286 SS Rivets, Annealed. They also reference the part number as being NAS 1199.

2. Potential 10 CFR Part 50.55(e) Construction Deficiency Report

Southern California Edison Company made a notification to the NRC that washers used on ITT's snubbers are not hardened, in that they are brass and not carbon steel.

ORGANIZATION: ITT GRINNELL
PIPE HANGER DIVISION
ENGINEERING DEPARTMENT
PROVIDENCE RHODE ISLAND

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ASME Code, Section III, NF 4724 states in part, "Bolts tightened by means of a calibrated wrench shall be installed with a hardened washer under the nut or bolt head . . . ."

ITT was notified by Bechtel through issuance of Quality Surveillance Deficiency Report Nos. 81-01 and 81-02, both dated April 3, 1981, of this condition.

ITT evaluated the problem by performing hardness tests on the two types of washer material and conducting vibration testing on one of each size snubber assembly involved. The vibration tests showed that with the use of either the brass or steel washer, the bolted connections performed adequately. The hardness tests showed that the brass washers were actually harder than the steel washers as they were produced from a cold-worked brass strip material. The actual hardness readings obtained were Rockwell A 30.9 and 34.3 for the steel washers, and Rockwell superficial 15T 88.7 for the brass. There are no specific hardness requirements for "hardened" washers.

A review of the associated drawings, BH 1258 and BH 1264, showed that prior to June 4, 1981, the washer standard to be used was Standard C-4-4.1, dated March 21, 1969. This standard states, "material: Carbon steel." A revision to both drawings on June 4, 1981, changed the requirement from standard C-4-4.1 to ASTM F436, paragraph 5. Paragraoh 5 requires washers to have a hardness of Rockwell 38 to 45, except that when hot-dipped galvanized they shall have a hardness of Rockwell C 26 to 45.

The brass washers that were used by ITT are defined in Standard C-4-4.4 dated April 2, 1969, which states with respect to material, "ASTM B36, alloy 260 or alloy 268." ASTM B36 is the standard specification for brass plate, sheet, strip, and rolled bar. The hardness range for the category that was used by ITT is Rockwell B 44-77.

However, brass was not specified on the drawings and as a result, nonconformance B.1 was identified.

ORGANIZATION: ITT GRINNELL
PIPE HANGER DIVISION
ENGINEERING DEPARTMENT
PROVIDENCE, RHODE ISLAND

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3. Unresolved Item Identified at ITT, Warren, Ohio, Inspection Report 99900282/81-01:

An unresolved item was identified during an inspection conducted at ITT's Warren, Ohio, facility which pertained to Procedure PE-217-1, "Installation Instructions-ITT Grinnell Pipe Hangers," not addressing the use of spacers at the rear bracket end of sway struts. If the spacers are not installed, the spherical ball bearing may become completely disengaged for certain sized struts.

ITT revised Procedure PE-217-1 and issued Revision 2 on March 2, 1981, with subsequent Revision 3 being issued on October 16, 1981. Section V "sway struts," paragraph 2.b states, "Attach the structural attachment insuring that the spacers provided with the assembly are properly installed. There must be one spacer on each side of the rod end assembly to insure that the ball bushing will remain centered on the load pin so that the full ±5° swing can be obtained."

ITT distributed the revised procedure to the following customers on the indicated date:

TVA - March 11, 1981;

Texas Utilities Services, Inc. - March 11, 1981;

Stone & Webster Engineering Corporation - (Nine Mile Point) - April 28, 1981; and

Associated Piping and Engineering Company (WPPSS 3 and 5) - February 10, 1982.

This item is considered resolved and will also be noted in the inspection report following the next scheduled inspection at ITT Grinnell, Warren, Ohio.

4. 10 CFR Part 50.55(e) Construction Deficiency Report:

TVA made a notification to the NRC that two examples of hanger material were found to have linear indications at the Bellefonte Nuclear Power Station. These indications were discovered in areas

adjacent to welds which were being liquid penetrant examined. The size of the indications were such that they were not detected during final inspection by visual means.

ITT did perform an evaluation, by taking cross sections of the affected areas and performing photomacro and micrographs. The results showed indications up to 0.017" depth and 0.045" in length. The evaluation was reported in Report No. 3057 dated August 28, 1981, "Resolution of Surface Indications In M Beams of ASME SA-36 Steel, Bellefonte Nuclear Power Station, Tennessee Valley Authority."

The results of the evaluation concluded that the linear type indications were surface lap conditions which occassionally occur in structual steels and that they do not affect the integrity of the beams, thus are considered acceptable for the service intended.

5. 10 CFR Part 50.55(e) Construction Deficiency Report:

Duke Power Company made a notification to the NRC that riser clamps had been received at Catawba Nuclear Station, Unit 1 which had been fabricated at ITT's Henderson, Tennessee facility, an unapproved source for providing components to nuclear sites.

One Figure 261, 6" riser clamp was identified and returned to ITT for replacement. The Henderson facility provides commercial items to the Warren plant for use in non-nuclear component supports. The Warren plant maintains an inventory of these parts and it appears that when a bulk shipment of riser clamps was made to Duke Power, one clamp was used from the Henderson supplied inventory. ITT Quality Control personnel did not detect this clamp prior to shipment, even though there is a unique identification on Henderson supplied material.

This item is considered an isolated incident. ITT's Quality Control Manager has held training sessions with all inspection personnel pertaining to material identity and control, and the correct usage of commercial and nuclear components.

ORGANIZATION: ITT GRINNELL
PIPE HANGER
ENGINEERING DEPARTMENT
PROVIDENCE, RHODE ISLAND

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6. Potential 10 CFR Part 50.55(e) Construction Deficiency Report:

Duke Power Comapny made a notification to the NRC that a snubber had been received at the Catawba site in which the 6" extension piece had been welded 1/4" off center.

Duke Power Company returned the snubber extension piece back to ITT Warren with nonconformance report number 13635, dated December 28, 1981. This piece was replaced; however, ITT performed an analysis considered ultra conservative which included the worst-case mismatch and offset variables. ITT's conclusion, noted in Report No. SA-2824 dated January 21, 1982, showed that the Figure 207N, size No. 1, 4" stroke snubber with the extension piece, would not meet the rated load for the Level C condition (2010.81 lbs. vs. 2067 lbs). The report further stated the "qualified load is approximately 3% less than the rated load (2067 lbs). The BEAMCL computer program is a conservative analysis, therefore, 3% difference in rated load is justifiable for this analysis. The extension piece for Fig. 307N size No. 1, 4" stroke is qualified for the rated load with pin-to-pin distance of 59½" max."

Discussion with the Warren QC Manager indicated that fixturing/templates are used when welding the extension piece to the plate and the item is inspected. The QC Manager committed to a thorough review of the welding/inspection process for these items. This item will require followup during the next inspection at ITT Grinnell, Warren, Ohio.

7. Follow Up On Regional Request:

NRC Region IV requested a followup inspection at ITT Grinnell, predicated on a nonconformance report and action request by Public Service Company of Colorado (PSC) pertaining to torque specifications which resulted in causing snubber threads to strip at Fort St. Vrain. The request indicated that the problem was associated with the 1½" cylinder "K" type, which is the only size that Fort St. Vrain has utilized and concern was expressed that ITT may not have furnished manufacturer's recommendations concerning the torque limits for the "K" type snubber to other sites.

ORGANIZATION: ITT GRINELL
PIPE HANGER DIVISION
ENGINEERING DEPARTMENT
PROVIDENCE, RHODE ISLAND

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PSC's Nonconformance Report (NCR) No. 81-13, dated February 3, 1981, states that the torque value for tie rods is too high, causing threads to strip and the ITT Grinnell repair manaul calls for 21 ft. lbs. for 1½" Miller type snubbers. It further states that the cylinder tie rods for ITT's type "K" Miller cylinder should be torqued to 7±1 ft. lbs. per the manufacturer's (Miller) instructions. It also identified the tie rods as being 1/4".

The NRC inspector determined that ITT has supplied approximately 580 safety-related snubbers (Miller cylinders), which consisted of 1½" and 2" "J" type, and 1½", 2½", 3¼", 4" and 5" "H" type. ITT's procedure No. PHD-6511-6 dated December 14, 1976, Section H, paragraph 13, states, "Install tie rod hex nuts and torque evenly to requirements shown below:

H Type Cylinder-Size	Torque (ft/lbs.)
1½"	21
2½"	54
3¼	95
4"	150
5"	315
6"	465

A review of the Miller Fluid Power Company's (MFP) catalogue and a telephone call to MFP on February 11, 1982, revealed that the only type cylinders manufactured have been types A, H, and J. The MFP catalogue further shows that the ¼" tie rods (discussed in PSC's NCR) are used with the 1½" "J" type cylinder, and the torque value is stated as being 8 ft/lbs.

It would appear that personnel at Fort St. Vrain applied the specified torque of the 1½" "H" type cylinder (21 ft/lbs.) to the 1½" "J" type cylinder (8 ft/lbs.) which causes stripping of the threads.

8. Unresolved item Identified at ITT, Warren, Ohio, Inspection Report 99900282/81-01:

An unresolved item was identified during an inspection at ITT's Warren, Ohio facility, pertaining to deficient welding symbology used in ITT drawings, as reported by TVA in a CDR regarding Bellefonte, Units 1 and 2. ITT designated the use of fillet welds for skewed T-joints having angles less than 60° or more than 135°. AWS D1.1 requires groove welds for these configurations. ITT deleted the parenthesis around dimensions in the welding symbols on certain detail sheets resulting in depth of groove weld preparation being indicated rather than the intended groove weld throat size.

Prior to February 1, 1979, all welds were designated as fillet welds by ITT. An informal document titled "Everything You Ever Wanted to Know About Fillet Welds and Were Afraid to Ask!" was developed and issued on February 1, 1979. This document was used as a training aid for the engineering department personnel. This document addressed the requirements of AWS D1.1 in addition to ASME Code requirements. As a result, the introduction of groove welds in angles less than 60° or greater than 135° was made, and all drawings developed after that date reflect groove welds rather than fillet welds. TVA had accepted numerous drawings (pre-1979) which showed fillet welds.

The problem arose when TVA received drawings which were developed after February 1979, and which showed groove welds.

The contract documents between TVA and ITT reference both ASME Code Section IX and AWS D1.1. ITT's design calculations determine a required load per linear inch based upon joint loading and

ORGANIZATION: ITT GRINNELL
PIPE HANGER DIVISION
ENGINEERING DEPARTMENT
PROVIDENCE, RHODE ISLAND

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geometry. These values are compared with Engineering Standard ES-16, "Weld Design Procedure For Component Supports," which is applicable for welded connections under the jurisdiction of the ASME Code. Allowable loads per linear inch were calculated for the various fillet weld sizes and it was determined that the weld metal allowable load based on the calculated effective throat always exceeded the allowable loads stated in ES-16, thus the fillet welds meet ASME Code requirements.

ITT's policy pertaining to the use of parenthesis in bevel groove welds symbols, is that dimensions refer to effective throat and not depth of preparation, regardless of whether or not the parenthesis is omitted.

In addition, the tail of the symbols show, "no machining required," thus there would not be a depth of preparation. Further, these welds are filed welds and AWS D1.1 states that the engineer (designer) cannot specify the "depth of groove" without knowing the welding process and/or position of welding. AWS D1.1 is explicit in stipulating that only the effective throat is to be specified on design drawings for partial joint penetration groove welds.

Therefore, these items are considered resolved and will also be noted in the inspection report following the next scheduled inspection at ITT Grinnell, Warren, Ohio.

ORGANIZATION: JOSEPH OAT CORPORATION
CAMDEN, NEW JERSEY

REPORT NO.: 99900251/82-01	INSPECTION DATE(S) 3/8-12/82	INSPECTION ON-SITE HOURS: 31

CORRESPONDENCE ADDRESS: Joseph Oat Corporation
ATTN: Mr. J. Benckert, Manager
Quality Control
2500 Broadway
Camden, NJ 08104

ORGANIZATIONAL CONTACT: Mr. J. Benckert, Manager, Quality Control
TELEPHONE NUMBER: (609) 541-2900

PRINCIPAL PRODUCT: Nuclear Heat Exchangers and Fuel Storage Racks

NUCLEAR INDUSTRY ACTIVITY: Approximately 75% of Joseph Oat Corporation's activity is devoted to the commercial nuclear industry.

ASSIGNED INSPECTOR: Ross L Brown 4/12/82
Ross L. Brown, Reactive & Components Program Section (R&CPS) Date

OTHER INSPECTOR(S):

APPROVED BY: F. Barnes 4/13/82
I. Barnes, Chief, R&CPS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B; and 10 CFR Part 21.

B. SCOPE: Management meeting and status of previous inspection findings.

PLANT SITE APPLICABILITY: Not identified.

ORGANIZATION: JOSEPH OAT CORPORATION
CAMDEN, NEW JERSEY

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A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Violation (81-02): The inspector verified that Section 206 of the Energy Reorganization Act of 1974 has been posted on the employee bulletin boards in the production shop.

2. (Closed) Nonconformance A.1 (81-02): Review of weld and heat record for Job 2349-M verified that the record was corrected by QC after performance of a review of weld withdrawal slips which identified the weld seam number, weld procedure, welder, and weld electrode heat number.

   Indoctrination and training record dated June 26, 1981, verified that the plant manager conducted a training session with all welding personnel relative to the recording of pertinent information for all weld seams.

3. (Closed) Nonconformance A.2 (81-02): Review of the weld and heat record sheets verified that the applicable information was recorded for tube to tube sheet welds identified on drawing 6125, Revision 3, and 6128, Revision 4.

   Joseph Oat Corporation (OAT) letter to their customer, dated August 28, 1982, requested that they file the identified filler metal records in the job pacakges for Job Nos. J-2339-A through M.

4. (Closed) Nonconformance B (81-02): Review of the interoffice memorandum verified that written instructions were issued to the storeroom personnel relative to the disposition of returned electrode.

ORGANIZATION: JOSEPH OAT CORPORATION
CAMDEN, NEW JERSEY

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5. (Closed) Nonconformance C (81-02): The welder training session held on June 26, 1981, instructed the welders on the need for record accuracy. The QC daily inspection record verified conformance with the requirements.

6. (Closed) Nonconformance D.1 (81-02): Operation No. 4 on Master Traveler for Job No. 2441-2 has been revised to include the partition plate (longitudinal baffle) to shell welds as detailed on drawings D-7015-5 and D-7014-2.

7. (Closed) Nonconformance D.2 (81-02): Review of the weld heat record sheets for Job No. 2441-2A and B verified the records have been revised to include the applicable information for weld No. 146.

8. (Closed) Nonconformance E (81-02): Review of the applicable weld procedure (WPS-22, Rev. 12) verified that backgouging and grinding the backside of the weld to sound metal to remove the tack welds is required. The review of three travelers verified the removal operation had been performed, inspected, and approved. Review of four fitter welder records verified they are qualified per ASME Code Section IX.

9. (Closed) Nonconformance F (81-02): Review of drawing D-7015, Rev. 5, and D-7013 travelers for Job 2441-2B, and weld and heat record for this job verified that the drawing had been revised to identify the weld and that the appropriate activity has been accomplished and information documented.

10. (Closed) Nonconformance G (81-02): The inspector verified that the discrepancy in test results of the 7018 electrode used on Job 2335 for the nozzle welds in three Reaction Products Separation Tanks (RPS) for the Clinch River Breeder Reactor Plant (CRBRP) was transmitted to the customer (General Electric Company (GE)) in the Vendor Case Record VCR-J-2335-44. GE acceptance of the deficiency was verified in their letter XL-590-10487 which stated GE has also reviewed the stress in the nozzle where the weld wire was used and found that the weld is lightly loaded, and it is GE's conclusion that the test discrepancy in weld wire has no adverse effect on the safety or function of the tanks.

ORGANIZATION: JOSEPH OAT CORPORATION
CAMDEN, NEW JERSEY

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11. (Closed) Nonconformance H (81-02): Review of the OAT forming qualification procedure, five laboratory reports representing at least three heats of material for the RPS tanks at CRBRP project and GE's letter SL-590-10487 verified acceptance of Oat forming procedure.

    Oat did not attempt to universally qualify the tank material but rather qualified the forming procedure at the specified temperature of 10^{0}F.

ORGANIZATION: LIMITORQUE CORPORATION
LYNCHBURG, VIRGINIA

REPORT NO.: 99900100/82-02	INSPECTION DATE(S) 1/27-28/82	INSPECTION ON-SITE HOURS: 12

CORRESPONDENCE ADDRESS: Limitorque Corporation
ATTN: Mr. T. Mignogna
President
5114 Woodall Rd.
Lynchburg, VA 24506

ORGANIZATIONAL CONTACT: Mr. K. Groome, Quality Control Manager
TELEPHONE NUMBER: (804) 528-4400

PRINCIPAL PRODUCT: Electric Motor Actuated Operators

NUCLEAR INDUSTRY ACTIVITY: Limitorque Corporation (LC) supplies electric motor actuated operators for valve operation. LC nuclear involvement represents approximately 10 percent of their total production.

ASSIGNED INSPECTOR: _____ _____
Wm. D. Kelley, Reactive & Component Program Section (R&CPS) Date

OTHER INSPECTOR(S):

APPROVED BY: _____ _____
I. Barnes, Chief, R&CPS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made as a result of: (1) Construction deficiency reports by: (a) Consumers Power Company concerning the installation of underrated terminal blocks on component cooling water and service water system electric motor actuated valve operators at the Midland Nuclear Power Plant, Units 1 and 2; and (b) Louisiana Power and Light Company concerning the furnishing to Waterford Generating Station, Unit 3, of valve operators which
(SCOPE cont. on next page)

PLANT SITE APPLICABILITY:

Docket Nos. 50-329; 50-330; 50-382; 50-361; and 50-362.

ORGANIZATION: LIMITORQUE CORPORATION
LYNCHBURG, VIRGINIA

REPORT NO.: 99900100/82-02	INSPECTION RESULTS:	PAGE 2 of 8

SCOPE: (Cont.). contained motor pinion keys that had been made from a wrong material; and (2) a 10 CFR Part 21 report by Bechtel Power Corporation concerning the furnishing to Southern California Edison San Onofre Nuclear Generating Station, Units 2 and 3, of original and replacement motor pinion keys which had been made from a wrong material.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion II of Appendix B to 10 CFR Part 50 the quality assurance program did not provide for indoctrination and training of personnel performing activities affecting quality, other than those personnel reporting directly to the Quality Control Manager; i.e., training was not addressed for engineers, parts and shipping personnel, purchasing agents, order processors, and field service personnel associated with nuclear orders.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph A.2 of Section IV of the Quality Assurance Manual, a telephone order for five "Keys - Motor Pinion Gear," Drawing Number 60-563-0154-1, Revision A, was received and the parts shipped without the order being routed through the File Department.

3. Contrary to Criterion XVI of Appendix B to 10 CFR Part 50, the cause and corrective action to preclude recurrence were not documented in regard to:

   a. Furnishing of incorrect carbon steel keys with Certificates of Compliance indicating them to be 4140 alloy steel;

   b. Installation of improper terminal blocks by a Field Service Engineer.

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph D.1a of Section IX of the Quality Assurance Manual, the Shipping Department Supervisor did not ensure that all material shipped to a customer was properly identified, as evidenced by the shipment of 1030 carbon steel keys for an order (WKM Valve Division) requiring 4140 alloy steel keys.

ORGANIZATION: LIMITORQUE CORPORATION
LYNCHBURG, VIRGINIA

REPORT NO.: 99900100/82-02	INSPECTION RESULTS:	PAGE 3 of 8

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Construction Deficiency Report by Louisiana Power and Light Company (LPLC) - Problem reported was the discovery, as a result of the LPLC follow up of NRC IE Information Notice 81-08, that 10 LC valve operators furnished to Waterford Generating Station had keys of the wrong material holding the pinion gear to the electric motor shaft.

   a. Background

      NRC IE Information Notice 81-08, dated March 20, 1981, was issued as a result of the failures of the key holding the pinion gear on the motor shaft of the LC valve operators at the following plants:

      (1) Nebraska Public Power District - Cooper Nuclear Station

      (2) Boston Edison Company - Pilgrim Nuclear Power Station, Unit 1

      (3) Georgia Power Company - E. I. Hatch Nuclear Plant, Units 1 & 2

      (4) Power Authority of the State of New York - James A. Fitzpatrick Nuclear Power Plant.

   LC responded to the notice by notifying all of their customers by letter dated June 3, 1981, of their recommendation to replace all 1018 keys on their Size SMB-3 and SMB-4 valve operators equipped with motors that developed 150 foot pounds torque or greater, and all size SMB-5 valve operators. LC's letter stated that the replacement keys and their material certificate of compliance would be provided at no cost.

b. Findings

LC informed NRC IE:HQS in their letter of June 9, 1981, that they had reviewed their design calculations and had found the stresses in the keys of the 1018 material to be acceptable for normal valve operator service; however, the use of a 4140 key increased the ability of the valve operators to withstand impact and shock loads imposed by frequent reversal of the valve travel and/or the stalled motor condition. LC stated verbally it was their engineering judgment that the key failures were aggravated by the operation of valves without the flowing media in the pipe lines, sudden reversal of the valve travel, and/or electrically jumping the torque switch to effect a tight shutoff of leaking valves. As stated in LC letter of June 3, 1981, to their customers, no records were available prior to May 25, 1981, that would identify which key material was used on a particular order. Prior to this date LC had purchased their keys in bulk lots and performed inventory by weight count once a year.

The inspector verified that LPLC had been notified by LC of their recommendation to replace the keys of 1018 material with keys of 4140 material.

2. Construction Deficiency Report by Southern California Edison (SCE) - Problem reported was the discovery that the keys purchased from the WKM Valve Division of ACF Industries, Inc., for holding the pinion gear on the valve operator motor shaft, were 1030 carbon steel material and not the 4140 alloy steel indicated by the certificate of compliance.

a. Background

Bechtel Power Corporation (BPC) reported to NRC RIV by letter dated November 29, 1981, of improper key material in LC valve

operators installed on WKM valves at the SCE-San Onofre Nuclear Generating Station. Replacement keys of 4140 material were ordered from WKM who in turn ordered the keys from LC by TWX dated June 4, 1981. The NRC RIV inspector was informed by LC personnel that these keys were subsequently lost in the mail between WKM and San Onofre Nuclear Generating Station. WKM requested by telephone for LC to ship replacement keys and confirmed the order with a telecopy of their purchase order on July 21, 1981. The keys were withdrawn from stock and (with an accompanying material certificate of compliance) were shipped on August 19, 1981. Prior to installation, the replacement key material was analyzed by an unnamed independent laboratory who determined the key material to be 1030 carbon steel.

b. Findings

The NRC inspector observed that the keys of 4140 material are identified by a part number which is affixed to the front of the storage bin. The bin was observed to be adjacent to a bin containing keys of identical size of 1018 material. The keys do not have a material identification marking and keys of both materials were available to the employee withdrawing the keys for the WKM replacement order. The Manager of Quality Control issued a material certificate of compliance stating the keys were 4140 material.

The NRC inspector reviewed the limited number of documents available pertaining to the keys which consisted of the material certificate of compliance, the part drawing, a shipping list and an acknowledgment of the purchase order. The NRC inspector requested to see a copy of the nonconformance and corrective action documentation, and was informed corrective action had been implemented, but neither the nonconformance and corrective action, nor the retraining of the employee had been documented. Three nonconformances were identified.

c. Items Requiring Follow-up Inspection - The LC Material Review Board did not meet and decide the required corrective action with respect to identified cause of furnishing incorrect key materials to nuclear customers; i.e., material

identified as 1030 steel and 1018 steel were shipped to SCEC, San Onofre Nuclear Generating Station and LPLC, Waterford Generating Station repectively, as 4140 steel. A detailed evaluation of the LC quality assurance program provisions for material control will be made at a subsequent inspection, in order to assure compliance with Criterion VIII of Appendix B to 10 CFR Part 50.

3. Construction Deficiency Report by Consumer Power Company (CPC) - Problem reported was the discovery of underrated terminal blocks in LC valve operators that had been furnished by valve manufacturers to the Midland Nuclear Power Plant.

a. Background

CPC-Midland Nuclear Power Plant notified Region III of the NRC by letter dated February 13, 1981, of a defective item reportable under paragraph 50.55(e) of 10 CFR Part 50. The attachment to the letter states in part, " . . . The other 10 operators inspected had Marathon Series 300 blocks which were initially rated by Marathon for 600-Volt Service and have subsequently been derated to 300 volts by their catalog 10M79 . . . ."

b. Findings

LC stated in their letter to the Henry Pratt Co., dated January 21, 1981, that Marathon Special Products (MSP) had an Underwriter's Laboratory (UL) approval on the MSP 300 Series terminal block which specified that the terminal block rating was based on dimensional requirements and not on breakdown voltage. Currently the MSP 1979 catalog shows the 300 Series terminal block as carrying a UL rating of 300 volts. The LC letter referenced an article in the April 7, 1977 issue of Machine Design which states that most manufacturers rate their terminal blocks at one third of the breakdown voltage.

The NRC inspector verified that the MSP rating sheet for their 300 Series terminal block states the line to line breakdown voltage is 9,000 volts and the line to ground breakdown voltage is

11,200 volts. It is LC's position based on past experience and the actual breakdown voltage that the MSP 300 series terminal blocks are suitable for service in their valve operators because the motors operate on 460 volts.

4. Construction Deficiency Report by Consumer Power Company (CPC) - Problem reported was the discovery of terminal blocks for 120 volt service installed on LC valve operators for 460 volt service at the Midland Nuclear Power Plant.

   a. Background

      CPC-Midland Nuclear Power Plant notified Region III of the U.S. Nuclear Regulatory Commission by letter dated February 13, 1981, of a defective item reportable under paragraph 50.55(e) of 10 CFR Part 50. The letter states an investigation revealed that eight out of 18 LC valve operators had MSP Series 100, Clinch Jones Series 140, or Beau Products terminal blocks, which are underrated for 460 volt service.

   b. Findings

      A newly hired LC Field Service Engineer from the Willowbrook, Illinois, Service Center arrived at the CPC Midland Nuclear Power Plant on November 21, 1977, to make architect-engineer requested field changes of the terminal blocks on LC valve operators. The change requested was the replacement of five terminal blocks on 71 valve operators. The architect-engineer had requested the change to permit one vacant terminal between the three 460 volt terminals connected to the motor and the two 120 volt terminals connected to the motor heater. Some of the motorized valve operators were modified at the Henry Pratt Company. The LC Lynchburg plant shipped 66 MSP 300 Series terminal blocks to the LC Willowbrook Service Center on November 16, 1977. Some of the terminal blocks were damaged in shipment, so an additional 20 Clinch Jones Series 140 terminal blocks were shipped on November 28, 1977; however, these terminal blocks could only be used in 120 volt control circuits and not the 460 volt power circuits. LC stated in their letter of January 21, 1981, to CPC that, "The field service engineer that performed the required terminal strip changes was a new employee and did not know at the time that the Clinch Jones terminal strips were not adequate to be used for power connections."

ORGANIZATION: LIMITORQUE CORPORATION
LYNCHBURG, VIRGINIA

REPORT NO.: 99900100/82-02	INSPECTION RESULTS:	PAGE 8 of 8

At LC's request terminal blocks were removed from several installed valve operators, and in addition to finding Clinch Jones Series 140 terminal blocks installed, a terminal block which appeared to be an MSP Series 100 was found installed on a valve operator supplied on LC Order 3A2337-B. LC examined their records and could not find any record where they had purchased MSP 100 Series terminal blocks, and therefore, concluded that it was possible that the inexperienced LC field service engineer obtained this terminal block locally at the job site.

The inspector reviewed one LC letter, one service call report, two lists of LC motorized valve operators, two shipping lists, one customer order acknowledgement and one shipping memo. One nonconformance was identified.

c. Item Requiring Follow up Inspection - Section 1 of the LC Quality Assurance Manual states that it is the intent of the manual with its supporting procedures to meet the applicable provision of Appendix B to 10 CFR Part 50. Criterion I of Appendix B requires the individuals assigned the responsibility for assuring effective execution of any portion of the quality assurance program to have direct access to such levels of management as necessary to perform this function. The Quality Assurance Manual splits the authority and responsibility for the implementation and enforcement of the quality assurance program between the Quality Assurance Administration, who reports to the Vice President Admimistration, and the Quality Control Manager, who reports to the Plant Manager. There are no documented lines of communication between the Quality Assurance Administration and the Quality Control Manager. A detailed evaluation of the LC organization will be made at a subsequent inspection, in order to assure compliance with Criterion I of Appendix B to 10 CFR Part 50, with respect to plant quality personnel having required authority and organizational freedom.

ORGANIZATION: PACIFIC AIR PRODUCTS COMPANY
SANTA ANA, CALIFORNIA

REPORT NO.: 99900769/82-01	INSPECTION DATE(S) 2/8-11/82	INSPECTION ON-SITE HOURS: 27

CORRESPONDENCE ADDRESS: Pacific Air Products Company
ATTN: L. R. Hess, President
3133 Harvard Blvd.
Santa Ana, California

ORGANIZATIONAL CONTACT: L. R. Hess, President
TELEPHONE NUMBER: (714) 557-1710

PRINCIPAL PRODUCT: Automatic Dampers

NUCLEAR INDUSTRY ACTIVITY: Approximately 75% of the production effort is devoted to nuclear.

ASSIGNED INSPECTOR: for H. W. Roberds, Reactive & Components Program Section (R&CPS) — Date: 4-2 82

OTHER INSPECTOR(S):

APPROVED BY: for I. Barnes, Chief, R&CPS — Date: 4-2-82

INSPECTION BASES AND SCOPE:

A BASES: 10 CFR Part 50, Appendix B, and 10 CFR Part 21.

B. SCOPE: This inspection was made as a result of the identification to Region IV of the Nuclear Regulatory Commission of potential material and design problems in automatic dampers supplied to Grand Gulf Nuclear Station by Pacific Air Products. Areas selected for inspection included: drawing control; control of purchased materials, manufacturing process control and final inspection.

PLANT SITE APPLICABILITY:

Dockets: 50-416, 50-417.

ORGANIZATION: PACIFIC AIR PRODUCTS COMPANY
SANTA ANA, CALIFORNIA

REPORT NO.: 99900769/82-01	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Quality Assurance Operating Procedure No. 10.0, inspection did not tag a shipment of 12 ga., 14 ga., and 16 ga. galvanized sheets, observed in the controlled storage area, with the required green accept tag.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Quality Assurance Operating Procedure No. 3.0, the Chief Engineer did not assure that design documents (drawings) contained correct and adequate application of design criteria, as evidenced by the absence on Drawing Sheet No. 5445-14, Rev. 4 for Shop Order 1383, Damper Nos. 1-CBA-DP-27A and B, of required location of welds, joint configuration and weld sizes.

3. Contrary to Criterion V of Appendix B to 10 CFR part 50 and Quality Assurance Operating Procedure No. 10.0, an in-process inspector did not tag an actuator mounting bracket on Damper No. 1-CBA-DP-27A as nonconforming although observed by the NRC inspector to contain cracks at both ends of a bend.

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. 10 CFR Part 50.55(e) Construction Deficiency Report (CDR)

The problem reported to the NRC by Mississippi Power and Light Company was tne failure of an actuator to damper shaft coupling in the HVAC automatic dampers in the Diesel Generator Building at Grand Gulf Nuclear Station.

ORGANIZATION: PACIFIC AIR PRODUCTS COMPANY
SANTA ANA, CALIFORNIA

REPORT NO.: 99900769/82-01	INSPECTION RESULTS:	PAGE 3 of 3

An investigation by Pacific Air Products Company (PAPCO) revealed that the actuators were misaligned with the damper shaft when the unit was installed which created an additional stress on the coupler. The actuators were installed to the damper by site personnel at the request of Bechtel Power Corporation, Grand Gulf Nuclear Station PAPCO requested the return of all couplers from Grand Gulf and performed torque test on the returned couplers at 600% overload rate with no observed failures of the couplers.

To prevent future failures as a result of misalignment, PAPCO has redesigned the coupler by the addition of an attached sleeve to provide additional reenforcement.

2. Material Identification and Control

This area of the inspection was performed by review of the applicable Quality Assurance requirements, associated documentation and observations of the controlled storage area Nonconformance Item B.1 was identified.

3. Drawing Control

This area of the inspection was performed by review of the applicable Quality Assurance requirements, associated documentation and four drawings issued to production at various stages of the fabrication cycle. Nonconformance Item B.2 was identified.

4. Manufacturing Process Control and Final Inspection

This area of the inspection was performed by review of the applicable Quality Assurance requirements, associated documentation and five production order travelers at various stages of the fabrication cycle. Nonconformance Item B.3 was identified.

ORGANIZATION: THE WILLIAM POWELL COMPANY
CINCINNATI, OHIO

REPORT NO.: 99900057/82-01	INSPECTION DATE(S) 2/22-26/82	INSPECTION ON-SITE HOURS: 60

CORRESPONDENCE ADDRESS: The William Powell Company
ATTN: Mr. Paul Niehaus, Vice President
of Engineering and Manufacturing
2503 Spring Grove Avenue
Cincinnati, Ohio 45213

ORGANIZATIONAL CONTACT: Mr. E. E. Winterfeldt, Corporate QA Manager
TELEPHONE NUMBER: (513) 852-2967

PRINCIPAL PRODUCT: Nuclear Valves

NUCLEAR INDUSTRY ACTIVITY: Fifteen contracts for ASME, Class 1, 2, and 3 valves.

ASSIGNED INSPECTOR: _____ 3/30/82
R. L. Brown, Reactive & Components Program Section (R&CPS) Date

OTHER INSPECTOR(S): L. E. Ellershaw, R&CPS
E. L. Hines, R&CPS

APPROVED BY: _____
I. Barnes, Chief, R&CPS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21 and 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was conducted as a result of: (1) allegations made regarding improper weld repairs of hardfacing on valves supplied to Cincinnati Gas & Electric Company's Wm. H. Zimmer Nuclear Power Station, Unit 1; and (2) a Construction Deficiency Report from Mississippi Power & Light Company pertaining to valve stem protectors creating operational problems at Grand Gulf Nuclear Station, Unit 1. Additional areas inspected
(SCOPE Cont. on next page)

PLANT SITE APPLICABILITY:

While the activities of this organization relate to numerous plant sites, this inspection was limited to the activities concerning Docket Nos. 50-416; 50-417; and 50-358.

ORGANIZATION: THE WILLIAM POWELL COMPANY
CINCINNATI, OHIO

REPORT NO.: 99900057/82-01	INSPECTION RESULTS:	PAGE 2 of 6

SCOPE (Cont.) included nondestructive examination personnel qualifications, weld material control, manufacturing process control, nonconformances and corrective actions, change control and status of previous inspection findings.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and QA Manual Article 5, paragraph 5.5.1.4, controlled welding materials were stored in holding ovens in the Bonded Storage areas in which they were not separated nor was identity maintained; e.g.:

   a. Holding oven number 2027, bin 4, identified as containing 5/32" type 8018 electrodes, also contained 5/32" type 7018 electrodes.

   b. Holding oven number 5850 was identified as containing various sizes of type 7018 electrodes, stored in their respective bins, however, numerous unidentified electrodes were also found in this oven.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and QA Manual, Article 2, paragraph 2.14.9.2, a number of inspection steps on certain rework routers had not been stamped in the appropriate column to signify acceptance.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

(Open) 10 CFR Part 21 Report (79-02):

1. Mississippi Power and Light Company Grand Gulf, Unit 2. The structural configuration changes for the 36 Unit 2 valves had not been started. The William Powell Company (WPC) management stated that WPC is negotiating with the utility company relative to the responsibility for the modifications.

2. Cincinnati Gas and Electric Company Zimmer Project. WPC has completed the seismic analysis of the Zimmer Valves, using the latest approved design evaluation methods (computer program, etc). The results of

these analyses have been submitted to Sargent & Lundy Engineers (S&L) (plant AE). There has been some communcations between WPC and S&L relative to this subject, but a final disposition nas not been determined.

E. OTHER FINDINGS OR COMMENTS:

1. Change Control: Review of one customer change request, one change to WPC order, order addenda assignment record, controlled material bill of change, bill of change distribution sheet, addendum to seismic report, three drawings, list of material, submittal letter to customer for field conversion, and document recall requests verified conformance with the program that describes the method of entering the customer documents into the system and control of the generated documents through the plant operations.

2. Control of Nonconformances and Corrective Action: Review of eight trouble analysis reports, eight production rework routers; three audit reports, three corrective action requests and one material review board report verified that discrepancies are identified, corrective action taken, activities are documented and reported to management as required by the quality assurance manual.

3. Manufacturing Process Control: Shop activities are controlled by routers. Review of three routing cards, process control sheets for three shop orders and nine routers verified that the pertinent manufacturing and inspection steps were identified, the assigned witness/hold points were appropriately signed and the completed router was signed by quality personnel signifying acceptance, however, one nonconformance was identified (see paragraph B.2).

4. General: WPC management stated that effective March 1, 1982, the commercial nuclear valves assigned to Plant 1 (Docket 99900269) will be transferred to Plant No. 2.

   They also stated that Plant 1 will let the ASME Certificate N-1337 expire on March 1, 1982.

   They further stated that in the future Plant 1 may do subcontract work, in which case they will be treated as any other vendor on the approved vendor list.

5. Follow up of Allegations: On September 25, 1981, an allegation was made by a former employee of the William Powell Company (WPC) to the NRC's Region III inspector at the Wm. H. Zimmer Nuclear Power Station, pertaining to improper repair welding performed on the hardfacing of valve seats and discs by WPC during 1977-1978, on valves supplied to the Zimmer and Enrico Fermi Atomic Power Plant sites. The

alleger provided specific control numbers of the valves for which he was concerned; e.g., 71C, 1021C, 1028C, and 1048C. The alleger further stated that all four valves would bear his identification number, as he had performed certain operations. During this inspection, the NRC inspector reviewed the quality assurance documentation of the four valves in question.

a. Valve 71C: This valve was never manufactured. The number, 71C, was assigned to a 4", 150 lb. valve destined for Arkansas Power & Light Company. A shop order was initiated on August 14, 1971, and subsequently cancelled on October 14, 1971. No manufacturing operations were ever performed.

b. Valve 1021C: This valve was supplied to Mississippi Power & Light Company (MP&L). The valve is a 4", 150 lb. weld end gate valve with a forged body. The route sheet was initiated on June 30, 1976, and the valve was completed and sent to the bonded store room on February 14, 1977. There was no hardfacing operation performed on the disc which is SA 351, stainless steel, Grade CA 15. There was hardfacing of the carbon steel, SA-105, seat rings, with Stellite No. 6. This operation was performed on February 2, 1977, with subsequent magnetic particle examination (MT) performed on February 11, 1977. The MT was a mandatory hold point which was witnessed by the customer.

c. Valve 1028C: This valve was supplied to MP&L and is a 3", 150 lb. weld end gate valve with a forged stainless steel body. The route sheet was initiated on February 7, 1977. The seat rings were assembled and welded on August 11, 1977 with subsequent liquid penetrant examination (PT) on August 19, 1977. Final inspection was performed and the valve body was sent to bonded stores on August 26, 1977. The disc is a stainless steel CF 8 casting which was hardfaced on August 17, 1977, with subsequent PT performed on September 28, 1977. Final inspection took place on October 14, 1977, and the disc was sent to bonded stores.

d. Valve 1048C: This valve was supplied to MP&L and is a 6", 150 lb. swing check valve, with a cast carbon steel body, grade WCB, and a forged carbon steel disc, SA-105. The route sheet for the body was initiated on March 25, 1976, with all operations completed on May 18, 1978. The route sheet for the disc was initiated on March 26, 1976, with final inspection on December 23, 1976. Hardfacing of the disc was performed on November 30, 1976, PT on December 20, 1976, and final inspection on December 23, 1976.

It should be noted that the ASME Code, Section III, NB, NC, and ND 2121(b) exempts valve seats from code jurisdiction.

All welding procedure specifications (WPS) and their procedure qualification records (PQR), designated as being used during hardfacing operations, were reviewed by the NRC inspector. In addition, the qualifications of the welders and the certified material test reports of the welding materials used, and the postweld heat treat charts were reviewed. The "Hardfacing Operation Record & Inspection Reports" (separate from the route sheets) were reviewed and compared with data on the route sheets for consistency related to dates, welders, and inspectors. The nondestructive examination reports were also reviewed.

There were no welding operations performed (nuclear) during this inspection, therefore, current, in-process activities could not be observed. The allegation was not substantiated, based on the documentation review of the four valves in question.

6. Construction Deficiency Report (CDR)

Mississippi Power & Light Company (MP&L) notified NRC's Region II office on March 14, 1980, of a CDR pertaining to the potential for valve stem protectors to cause valve misoperation due to excessive threading of the protectors. This would allow the protector to be screwed too far into the valve operator, thus acting as a jam nut against the stem lock nut. This problem was associated with WPC valves.

WPC was not formally notified by MP&L or Bechtel, the architect engineer and constructor. An internal, Bechtel memo dated March 14, 1980, dealing with stem protectors on motor operated valves, was provided to WPC. In addition to the memo, Bechtel Management Corrective Action Report No. 65 dated March 14, 1980, and Startup Field Report No. 1-M-385 dated March 3, 1980, were provided to WPC.

WPC, because of this information, initiated a documented inspection program to measure the clearances between the stem protectors and the stem lock nut on all motor and adaptor gear operator valves. This inspection was initiated in May 1980, and continued through July 1980. Approximately 150 valves were inspected and there was not one case where the stem protector created an interference; thus, the inspection program was terminated.

ORGANIZATION: THE WILLIAM POWELL COMPANY
CINCINNATI, OHIO

REPORT NO.: 99900057/82-01	INSPECTION RESULTS:	PAGE 6 of 6

Observation of two nuclear valves with stem protectors revealed that the stem protectors could not be forced in far enough to create an interference. However, WPC agreed to reinstitute the documented inspection program to eliminate any possibility of this type problem.

7. Nondestructive Examination (NDE) Personnel Qualifications

The qualifications of seven NDE personnel were reviewed, including results of written examinations and eye examinations. The review included four NDE disciplines: magnetic particle examination; liquid penetrant examination; radiography; and ultrasonic examination. This area appeared to be in conformance with WPC's QA Program commitments.

8. Weld Material Control

This area of the inspection was performed by: observing weld material storage, including holding ovens; review of 10 weld material test reports associated with the electrodes identified in the holding ovens; and review of the welding material issue system.

Nonconformance B.1 was identified during this portion of the inspection.

ORGANIZATION: SIEMENS-ALLIS, INC.
SMALL MOTOR DIVISION
LITTLE ROCK, ARKANSAS

REPORT NO.: 99900338/82-01	INSPECTION DATE(S) 2/16-18/82	INSPECTION ON-SITE HOURS: 16

CORRESPONDENCE ADDRESS: Siemens-Allis, Inc.
Small Motor Division
ATTN: Mr. William E. Onyett
Manager, Quality Assurance
1400 Dineen Drive
Little Rock, AR 72206

ORGANIZATIONAL CONTACT: Mr. William E. Onyett, Manager, Quality Assurance
TELEPHONE NUMBER: (501) 897-4905

PRINCIPAL PRODUCT: Small Electric Motors, 5 HP - 75 HP

NUCLEAR INDUSTRY ACTIVITY: Commercial nuclear production of small electric motors Class 1E, 5 HP to 75 HP. At present all nuclear orders have been filled and shipped. No commercial nuclear contracts are in house.

ASSIGNED INSPECTOR: J. W. Sutton — 4-14-82
J. W. Sutton, Reactive & Components Program Section (R&CPS) — Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes — 4-14-82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and 10 CFR Part 21.

B. SCOPE: Status of previous inspection findings and vendor activities.

PLANT SITE APPLICABILITY:

Not identified.

ORGANIZATION: SIEMENS-ALLIS, INC.
SMALL MOTOR DIVISION
LITTLE ROCK, ARKANSAS

REPORT NO.: 99900338/82-01	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS

1. (Closed) Violation (80-01): Current copies of 10 CFR Part 21 not posted.

   The inspector verified that current copies of 10 CFR Part 21 have been posted on all office and factory bulletin boards.

2. (Closed) Deviation A (80-01): Index checklist for audit report and audit summary had not been formulated or included in revisions to forms.

   The inspector verified by review of five nuclear audits, revised QA procedures and forms that the commitments made in Siemens-Allis' February 16, 1981, reply to NRC's letter of February 5, 1981, have been satisfactorily implemented.

3. (Closed) Deviation B (80-01): Audit reports had not been completely filled out as required by Procedure 10.01.

   The inspector reviewed ten audit reports issued during 1981 for compliance to Siemens-Allis' (SA) commitment for filling out audit reports. The reports reviewed were found to be completed as required by SA's QA procedures.

4. (Closed) Deviation C (80-01): Quality Assurance had not audited or applied "Hold Tags" on certain identified motors.

ORGANIZATION: SIEMENS-ALLIS, INC.
SMALL MOTOR DIVISION
LITTLE ROCK, ARKANSAS

REPORT NO.: 99900328/82-01	INSPECTION RESULTS:	PAGE 3 of 3

The inspector verified by examination of available shop records, audits and work in progress that "Hold Tags" are being used to identify defective parts or tests for repair or rework. The QA inspector is stamping those operations that he has witnessed. The inspector examined six "Hold Tags" for conformance and all were found to have been completed as required by SA QA procedures. Random audits have been conducted by QA personnel for compliance.

5. (Closed) Deviation D (80-01): Measures had not been established and documented to assure control and distribution of documents, including changes to the location or person using the documents.

   The inspector reviewed current test specifications, and test station engineering copies of tests, weekly audits, and other available documentation to verify that current documents have been distributed as required by QA procedures. The documents reviewed were found to be in order and comply with required distribution.

6. (Closed) Deviation E (80-01): File copy of operator instruction sheets had not been approved by production or manufacturing.

   The inspector reviewed a QA audit of all master NSRE-OIS sheets for signature. The inspector verifed that all previous sheets had been signed off as required. Five current sheets and master sheets were reviewed and found to have been signed off as required.

7. (Closed) Deviation F (80-01): Aperture cards from product engineering file had not been removed or marked as required by procedure.

   The inspector reviewed the aperture file to determine if procedures are being followed. Procedure GP 15 has been revised to clarify paragraph 4.1.4 requirements. QA has conducted audits to assure compliance to the revised requirements.

8. (Closed) Deviation G (80-01): Item sheets had not been signed off and the person checking the Test Data Sheets had not noted "verified" by his name.

   The inspector verified by review of ten current item sheets that the signatures of all required personnel have been recorded and verified.

   SA QA personnel have conducted audits of this area to assure compliance with procedure requirements.

ORGANIZATION: SQUARE D COMPANY
CONTROL GROUP
RALEIGH, NORTH CAROLINA

REPORT NO.. 99900717/82-01	INSPECTION DATE(S) 3/8-12/82	INSPECTION ON-SITE HOURS: 28

CORRESPONDENCE ADDRESS: Square D Company
Control Group
ATTN: Mr. D. J. Beck, Plant Manager
P. O. Box 27446
Raleigh, NC 27611

ORGANIZATIONAL CONTACT: Mr. W. J. Fightmaster, QA Manager
TELEPHONE NUMBER: (919) 266-3671

PRINCIPAL PRODUCT: Class 1E starters and contractors.

NUCLEAR INDUSTRY ACTIVITY: Commercial Nuclear Production of Square D Company, Control Group, Raleigh, North Carolina, totals less than 1% of total company production. Two nuclear contracts are presently in-house for future production.

ASSIGNED INSPECTOR: J W Sutton 4-2-82
J. W. Sutton, Reactive & Component Programs Section (R&CPS) Date

OTHER INSPECTOR(S):

APPROVED BY: I Barnes 4-5-82
I. Barnes, Chief, R&CPS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: Follow up previous inspection findings, nonconformance/corrective action, audits and review of vendor activities.

PLANT SITE APPLICABILITY:

Not identified.

ORGANIZATION: SQUARE D COMPANY
CONTROL GROUP
RALEIGH, NORTH CAROLINA

REPORT NO.: 99900717/82-01	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Deviation A.1&2 (Report 80-01): Setup and Run Sample Inspection Sheet not completed as required. Run checks not conducted or required. The inspector reviewed the corrective action taken by Square D Company to prevent recurrence. Thirteen shop Setup Sheets completed since issuance of an instruction letter dated June 25, 1980, were reviewed for compliance. As a result of the review, the inspector determined that inspectors are complying with the inspection procedure and signing the Setup Sheets as required by QA instructions and a Square D letter of June 25, 1980.

2. (Closed) Deviation B.1&2 (Report 80-01): Name of issuing engineer not shown in the deviation stamp for extension of a drawing deviation. The inspector reviewed the corrective action and preventive measures taken by Square D Company to prevent recurrence of this item.

   The inspector checked five drawings with current deviations to determine that the engineer is signing the deviated drawing. In addition, QA audits of the deviation files have been performed for compliance to QA procedures/instructions.

   As a result of the review of the above documents, the inspector has determined that drawings are being controlled as required by QA procedures.

3. (Closed) Deviation C (Report 80-01): Weekly Delinquent Reports did not include the number of problem reports initiated and resolved during the month, nor the number of problem reports pending.

ORGANIZATION: SQUARE D COMPANY
CONTROL GROUP
RALEIGH, NORTH CAROLINA

REPORT NO.: 99900717/82-01	INSPECTION RESULTS:	PAGE 3 of 4

The inspector reviewed the revised Standard Practice Instruction (SPI) 655.1-M29 dated June 27, 1980, for revised changes. In addition, the inspector reviewed six current delinquent Materials Reports to determine if the revised instructions are being followed. The inspector has determined that corrective action and preventive measures instructions are being implemented as required in the SPI.

4. (Closed) Deviation D.1,2,3,4 (Report 80-01): Failure to maintain identifying numbers, cards, recalibration schedules, and calibration stickers on equipment in the controlled Square D calibration system.

   The inspector reviewed the corrective action/preventive measures taken by Square D Company to correct this item. The following areas were checked for conformance. Letter of June 23, 1980, to all tool and gage inspectors to maintain calibration control. Review of the cardex system for control of calibration. The inspector also examined 6 gage control cards for compliance, and examined 10 tools, gages, and bench boxes for calibration stickers and calibration dates. The inspector also reviewed all QA audits conducted for compliance to preventive action commitments.

   As a result of the review of documentation, the inspector determined that activities relating to control of calibration of equipment now conform to QA manual and instruction requirements.

5. (Closed) Deviation E (Report 80-01): Basic Device Gaging Fixture and accompanying gage blocks not calibrated to provide assurance that they were of the required accuracy and in acceptable operating condition.

   The inspector reviewed the corrective action and preventive measures taken by Square D Company to determine if any other nonidentified gages were in the final inspection/acceptance areas. The inspector conducted inspection of these areas and found that acceptance gages, tools, etc., had been calibrated and were being controlled. The QA instructions were being complied with, as required.

6. (Closed) Unresolved Item C.3.b (Report 80-01): Manufacturing process control. There is no requirement to maintain records of routing checks to ML-STD-105D.

   The inspector reviewed five Routing Check Sheets to determine if records of routing checks are being completed as required by instructions.

   As a result of this review, the inspector determined that QA instructions are being followed as required.

ORGANIZATION: SQUARE D COMPANY
CONTROL GROUP
RALEIGH, NORTH CAROLINA

REPORT NO.: 99900717/82-01	INSPECTION RESULTS:	PAGE 4 of 4

7. (Closed) Unresolved Item D.3.b: Procedure to control salvage activities not available.

The inspector reviewed minutes of weekly meetings held with the QA Manager, Plant Supervisor, General Supervisor of Areas, and General Supervisor Inspection, conducted to determine and follow up on identified salvageable materials that would be returned to stock. Management has decided that a procedure to control this item is not necessary. After review and discussion with Square D management personnel, the inspector concurred that the control of salvageable materials was being handled in an acceptable manner.

D. OTHER FINDINGS:

1. Nonconformance/Corrective Action - The inspector reviewed Square D's QA Manual instructions 653-M-165, R655-E-132b-R655.1 and R655-E-126b covering control and disposition of nonconforming items. The inspector reviewed 6 nonconformances, 10 Weekly Deficiencies Reports and 11 Quality Problem Reports and associated documentation for conformance to QA/QC instructions. The corrective action taken to prevent recurrence was examined for implementation. Segregation areas designated for storage of nonconforming items were inspected. Relative to the documents examined, the inspector determined that activities relating to the control and disposition of nonconforming items complied with Square D's QA/QC program requirements.

2. Audits - The inspector reviewed Square D's QA Manual, SPI-E-136b, Audits for Compliance to 10 CFR Part 50 Requirements. Twenty completed audits, corporate group audits, interoffice memos of QA activities and corrective action taken as a result of the audits conducted were reviewed for compliance to QA instructions. As a result of the review, the inspector determined that the audit requirements, both corporate and plant, were being followed as required by QA instructions.

ORGANIZATION: STONE AND WEBSTER ENGINEERING CORPORATION
BOSTON, MASSACHUSETTS

REPORT NO.: 99900509/82-01	INSPECTION DATE(S) 3/8-12/82 & 3/22-26/82	INSPECTION ON-SITE HOURS: 111

CORRESPONDENCE ADDRESS: Stone and Webster Engineering Corporation
ATTN: Mr. R. B. Kelly
Vice President, Quality Assurance
P. O. Box 2325
Boston, MA 02107

ORGANIZATIONAL CONTACT: Mr. F. B. Baldwin, Assistant QA Manager
TELEPHONE NUMBER: (617) 973-6566

PRINCIPAL PRODUCT: Architect Engineering Services

NUCLEAR INDUSTRY ACTIVITY: Major projects include Beaver Valley 2, River Bend 1 and 2, Shoreham, Nine Mile Point 2, Millstone 3, North Anna 3, New Haven 1 and 2, Montague 1 and 2, and Jamesport 1 and 2. In addition, there are 44 modification/repair/service contracts. The aforementioned contracts cover work performed in the Boston, Cherry Hill, New York, and Denver offices.

ASSIGNED INSPECTOR: C. J. Hale 6/1/82
D. D. Chamberlain, Reactor Systems Section (RSS) Date

OTHER INSPECTOR(S): A. L. Smith, Equipment Qualification Section
J. I. Tapia, Engineering Section

APPROVED BY: C. J. Hale 6/1/82
C. J. Hale, Chief, RSS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and Topical Report SWSQAP 1-74A.

B. SCOPE: Status of previous inspection findings (Boston and Cherry Hill offices), design process management (follow up on concern identified in 81-03 report at Boston office), high energy line ruptures in fluid systems outside containment (Boston office), safe shutdown following pipe rupture outside containment (Cherry Hill office), and an
(cont. on next page)

PLANT SITE APPLICABILITY: Docket Numbers 50-404, 50-334, 50-412, 50-458, 50-459, 50-410, and 50-423.

ORGANIZATION: STONE AND WEBSTER ENGINEERING CORPORATION
BOSTON, MASSSACHUSETTS

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SCOPE: (Cont.)

inspection conducted as a result of the following 10 CFR Part 50.55(e) reports: (1) 10 CFR Part 50.55(e) Report (North Anna 3) - Pressurizer safety valve inlet piping design with large pressure drop could lead to valve chatter (Boston office); (2) 10 CFR Part 50.55(e) Report (River Bend 1 and 2) - Heat loads provided by General Electric to Stone and Webster (S&W) for sizing HVAC in the High Pressure Coolant System (HPCS) diesel generator room were about one-third of the expected valve (Cherry Hill office); and (3) 10 CFR Part 50.55(e) Report (Beaver Valley 2) - Structural calculations for control room extension contained errors (Boston office).

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of 10 CFR Part 50, Appendix B and Engineering Department Memorandum No. 82-3, all required experience records for designers in the electrical and the engineering mechanics division (Boston office) were not prepared or updated by March 1, 1982, as committed to the NRC.

2. Contrary to Criterion V of 10 CFR Part 50, Appendix B and Engineering Assurance Procedure 5.3, an assumption made in calculation No. 12179-US(B)-221 was not confirmed and the assumption was not identified as an assumption that required confirmation at a later date (Millstone 3 project).

3. Contrary to Criterion V of 10 CFR Part 50, Appendix B and Engineering Assurance Procedure 5.3, HVAC calculation PB-196 for control building cooling load contained input information that was not confirmed and "Yes" was not checked to indicate confirmation was required at a later date.

C. UNRESOLVED ITEMS:

None

ORGANIZATION: STONE AND WEBSTER ENGINEERING CORPORATION
BOSTON, MASSACHUSETTS

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D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Unresolved Item (81-03): It was not always apparent that the ANSI N.45.2.12 requirements and the S&W procedural requirements for holding a postaudit conference and identifying persons attending the postaudit conference are being followed.

   The NRC inspector examined a random sample of nine audits and verified that all reports contained documentation of both a postaudit conference and a list of attendees. It is concluded from this review that S&W is meeting these requirements of ANSI N45.2.12.

2. (Open) Nonconformance (81-04): Experience Records were not being updated on a yearly basis as required.

   S&W management had committed to having all required Experience Records updated by March 1, 1982. The NRC inspector examined a total of 46 experience records for both engineers and designers in the Boston and Cherry Hill offices. It was determined that the electrical and engineering mechanics divisions in the Boston office had not completed the update of all experience records for designers as committed. This item will remain open at the Boston office and a nonconformance (B.1 above) was issued for the failure to meet a commitment to the NRC.

E. OTHER FINDINGS OR COMMENTS:

1. Design Process Management (Follow up on concern identified in 81-03 report) - During the 81-03 NRC inspection, a discrepancy was identified on the Millstone 3 project relating to an instrument set point calculation for the component cooling water system. The calculation was a "trial" calculation for a new instrument set point calculation system that was being developed. A procedure for this system was issued on March 8, 1982, and a small number of calculations have been completed. From the review of this area, it was determined that the new set point calculation system is being implemented and should provide good control in the future.

2. High Energy Line Ruptures in Fluid Systems Outside Containment (Boston office) - The applicable SAR sections, procedures, and criteria for high energy line (HEL) rupture analysis were examined

to determine program requirements. The following design documents for the Millstone 3 project were examined to verify implementation of program requirements: eight design drawings, nine analysis calculations, and one specification. From this area of inspection, it was determined that the guidance provided in Branch Technical Positions MEB 3-1 and APCSB 3-1 are being followed for selecting pipe rupture locations, rupture sizes and geometry. A nonconformance was identified (B.2 above) regarding confirmation of assumptions in a pressure/temperature analysis calculation. The assumption stated that all areas sealed with weather-stripped doors are not exposed to high energy line breaks from adjacent areas. This assumption was not identified as an assumption that must be confirmed and there was no confirmation made to assure that the doors specified would withstand the pressures generated in adjacent compartments.

Due to the incomplete status of the HEL analysis for the Millstone 3 project by S&W, our inspection effort in this area could not be completed during this inspection.

3. Safe Shutdown Following Pipe Rupture Outside Containment (Cherry Hill office) - The review of HEL documentation on the River Bend project indicated that the break criteria contained in Branch Technical Positions APCSB 3-1 and MEB 3-1 were used as the basis for postulating pipe rupture conditions. The attempted review of documentation containing the plant transient analyses that support the position that the plant can be safely shutdown in the event of any pipe rupture indicated that the SAR Chapter 15 accident analyses are viewed as the bounding analyses as long as the safe shutdown systems are protected from the effects of pipe rupture. This area will be inspected further during subsequent inspections.

4. High Pressure Coolant System (HPCS) Diesel Generator Room Heat Loads - This area of inspection resulted from a 10 CFR Part 50.55(e) report (River Bend 1 and 2) which stated that the heat loads provided by General Electric (GE) to S&W for sizing the heating, ventilation, and air conditioning (HVAC) in the HPCS diesel generator room were about one third of the expected value. S&W had questioned the heat load values provided by GE because they were significantly lower, per kilowatt, than the values being used for the main plant diesels. GE is presently evaluating this item and S&W has not officially been

provided with new values. However, S&W evaluation has convinced them that the values are low and S&W has decided to revise the HVAC design to provide ventilation for the HPCS diesel generator room that equals the main diesel generator room capacity. S&W also had responsibility for design of HVAC for the Nine Mile Point (NMP) 2 project HPCS diesel generator room but the original design called for HVAC capacity equal to the main diesel generator room, therefore the design is adequate for NMP-2. An examination of the HPCS diesel generator room HVAC calculations revealed that S&W program requirements were implemented. The HVAC calculation for the Control Building Cooling Load (PB-196) was also examined to determine the source of heat load data and the required confirmation of input data used. A nonconformance was identified (B.3 above) regarding confirmation of input data. The inputs noted that require confirmation were GE supplied information that was identified as preliminary and heat load information for computer equipment. The specific nonconformance was corrected during this inspection by revising the calculation to indicate confirmation was required. It was also noted that S&W had performed an internal audit during March 1982, which identified similar concerns with HVAC calculations. However, S&W had not determined corrective actions and preventive measures for the internal audit finding, therefore, a response to the NRC nonconformance will be required. The HPCS diesel generator heat load item will remain open pending the completion of the GE evaluation and possible generic implications at other Architect Engineers. S&W actions for affected projects is adequate and no further review will be required at S&W.

5. Potential CDR Pressurizer Safety Valve Problem at North Anna, Unit 3 - The Electric Power Research Institute (EPRI) is currently performing a study of pressurizer safety relief valves and piping systems. The original study's intent was to qualify individual safety relief valves by testing various sizes and piping arrangements for safety relief valves representative of all reactors in operation or under construction. The original intent has had to be revised since representative safety relief valves have been found to interact with piping configurations (in particular the characteristics of piping upstream of the valve). EPRI contacted utilities to determine plant

specific safety relief valve inlet pipe configurations and performed a preliminary analysis using computer modeling to predict safety relief valve performance for the various configurations. The preliminary calculations performed under this study indicate that valve chatter (as a result of the pressure drop in the inlet piping) is expected on the North Anna, Unit 3, system. Virginia Electric and Power Company (VEPCO) had their A/E (Stone & Webster) review the EPRI calculations. The review performed by S&W indicated no inconsistencies in the EPRI calculation, hence, VEPCO notified Region II of a potential deficiency under the provisions of 10 CFR 50.55(e) and has instructed S&W to revise the design of the inlet piping to permit satisfactory valve operation.

S&W has entered this problem into their problem reporting system and VEPCO was informed that (a) the stress analysis of the pressurizer safety relief valve inlet piping has not been performed, (b) when performed the detailed stress analysis will consider the response of the piping system due to a valve opening transient condition of the type addressed by EPRI, and (c) if a detailed analysis indicates a degradation of system performance, the appropriate system component(s) will be redesigned to rectify the potential problem.

This item will remain open since this was a result of preliminary analysis and S&W prefers to have, in hand, the final EPRI report prior to initiating any redesign. In addition, a decision concerning increasing the height of the pressurizer is pending and any increase in pressurizer height would automatically result in a redesign of the inlet piping configuration. We will continue to monitor this potential problem for its generic aspects, since the preliminary EPRI findings indicated that several more plants may also experience probable safety relief valve problems, particular for the short valve opening times.

6. Structural Design Deficiencies at Beaver Valley, Units 1 and 2 - On August 31, 1981, Duquesne Light Company submitted a 10 CFR Part 50.55(e) report concerning structural design deficienies identified during the review of the design calculations for the Unit 2 control room extension. As a result of this discovery, S&W conducted a reverification of all calculations

ORGANIZATION: STONE AND WEBSTER ENGINEERING CORPORATION
BOSTON, MASSACHUSETTS

REPORT NO.: 99900509/82-01	INSPECTION RESULTS:	PAGE 7 of 7

performed by the group of engineers involved in the original design. The reverification program disclosed a discrepancy in the design of the Auxiliary Building floor slab supporting the boron recovery test tanks.

The NRC inspector performed an evaluation of the generic implications of all work performed by the group of engineers responsible for the design deficiencies. The evaluation included a review of the S&W problem report system documentation of the reverification of work. It was determined that the group of engineers was only involved in a limited scope of work in the Beaver Valley Project. The original calculations were performed in 1974 and 1975 in the New York office of S&W. The discrepancies involved failure to include loads due to flooding, failure to check drawings against calculation requirements for accuracy, and a failure to justify an engineering assumption pertaining to load distribution.

The S&W Engineering Assurance Division, in January of 1977, revised Engineering Assurance Procedure No. 5.3, "Control of Computerized and Manual Calculations," to include the requirement in NRC Regulatory Guide 1.64, "Quality Assurance Requirements for the design of Nuclear Power Plants" for an independent review of design calculations. The required independent design verification represents a more formalized program than that existing at the time of the discrepancies. By review of ongoing design activities during this inspection, the NRC inspector found that preventive measures now exist which are intended to preclude similar design deficiencies from being undetected.

ORGANIZATION: TELEDYNE ENGINEERING SERVICES
WALTHAM, MASSACHUSETTS

REPORT NO.: 99900513/82-01	INSPECTION DATE(S) 3/29-4/2/82	INSPECTION ON-SITE HOURS: 79

CORRESPONDENCE ADDRESS: Teledyne Engineering Services
ATTN: Mr. F. C. Bailey
President
130 Second Avenue
Waltham, MA 02254

ORGANIZATIONAL CONTACT: Mr. C. G. Sprangers, Manager, Quality Assurance
TELEPHONE NUMBER: (617) 890-3350

PRINCIPAL PRODUCT: Engineering and Consulting Services.

NUCLEAR INDUSTRY ACTIVITY: Approximately 90% of the staff of the Waltham, Massachusetts, facility and 30% of the Hayward, California, facility are involved in nuclear activities. Major projects include work on Turkey Point Units 3 and 4, V. C. Summer Unit 1, Fermi Unit 2, Limerick Unit 1, and Diablo Canyon Unit 1.

ASSIGNED INSPECTOR: C J Hale for 5/20/82
D. F. Fox, Reactor Systems Section (RSS) Date

OTHER INSPECTOR(S): A. L. Smith, Equipment Qualification Section

APPROVED BY: C J Hale 5/20/82
C. J. Hale, Chief, RSS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made as a result of concerns expressed to NRC pertaining to possible deficiencies in the analysis for structural integrity of the torus catwalk and piping of the Fitzpatrick and Vermont Yankee Nuclear Power Plants; to evaluate the in-place quality assurance program; and conduct an initial management meeting.

PLANT SITE APPLICABILITY: J. A. Fitzpatrick, Docket 50-333; Millstone Unit 1, Docket 50-245; Nine Mile Point Unit 1, Docket 50-220; Pilgrim Unit 1, Docket 50-293; Vermont Yankee, Docket 50-271; Diablo Canyon, Docket 50-275; and Enrico Fermi 2, Docket 50-341.

ORGANIZATION: TELEDYNE ENGINEERING SERVICES
WALTHAM, MASSACHUSETTS

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A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to the Criterion V of Appendix B to 10 CFR Part 50 and the Diablo Canyon Project Program Plan, QA records were not stored in a single record storage facility which meets the imposed requirements of ANSI/ASME NQA-1-1979, nor were the duplicate records stored in separate locations.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and section 3.0 of the QA Manual (QAM), design activities related to Mark I containment torus hydrodynamic analyses and design modifications for the J. A. Fitzpatrick, Millstone, Nine Mile Point, Pilgrim and Vermont Yankee Nuclear Power Plants were not being accomplished in accordance with the QAM. Specific examples of this nonconformance are:

   (a) Hydrodynamic analyses did not include sufficient referencing of source data, principles and assumptions to permit ready traceability as required by section 3.6.1 of the QAM. Further, the checker of hydrodynamic analyses did not perform the duties prescribed in section 3.6.2 of the QAM as required by section 3.6.1 of the QAM.

   (b) Calculations exhibiting the signatures of the originator, checker and the design verifier were not treated with the status of a QA record as required by section 3.6.3 of the QAM.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and the Project Quality Assurance Program (PQAP) for the J. A. Fitzpatrick, Millstone, and Vermont Yankee Nuclear Power Plants, activities affecting quality regarding Design/Analysis Control, Project Personnel Assignment, and Project General (Engineering) Control were not accomplished in accordance with prescribed procedures in that the required procedures were either not imposed or not being implemented on the above projects.

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4. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and the PQAP's for the Fermi 2, Millstone and Vermont Yankee projects, audits were not accomplished within the specified intervals, nor were they waived in accordance with the prescribed conditions and requirements.

5. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 17 of the QAM, PQAP's for eight projects contained a requirement to retain audit records for a period of 1 year, rather than for 6 years as required by the QAM.

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Management Meeting - The purpose, scope, and nature of the Licensee, Contractor and Vendor Inspection Program were reviewed with the President of Teledyne Engineering Services (TES) and the Quality Assurance Manager. The concerns expressed to NRC with respect to possible errors and deficiencies in the hydrodynamics load analyses of General Electric (GE) Mark I containment torus components, and in the subsequent design of related component supports, were outlined. The format, content, dissemination and publication of NRC inspection reports, and TES responses thereto, were discussed in detail.

2. Possible Analytical Deficiencies - An inspection was conducted to determine the validity and safety significant of concerns expressed to NRC that the use of unqualified individuals, inaccurate analytical models, erroneous input to structural calculations and excess management schedular pressure could result in possible deficiencies in the analyses for structural integrity, and in the subsequent design of internal and external component supports for the torus and its associated catwalks and piping of the Fitzpatrick and Vermont Yankee Nuclear Power Plants.

Review of TES records, and interviews with cognizant personnel, indicate that TES was contracted by the owners of the Fitzpatrick, Millstone Unit 1, Nine Mile Point Unit 1, Pilgrim Unit 1 and Vermont Yankee Nuclear Power Stations, in 1975-1976, to provide consulting services and to perform certain analyses and design

modifications pertaining to the torus of their Mark I containments. Some design modifications have already been supplied to and incorporated by the affected plants; however, the total contract effort is not scheduled for completion until late August 1982.

Review of employment, training, and qualification records, and interviews with selected engineering, management, and "contract" personnel, did not confirm the concerns that unqualified individuals were employed to do this work nor that TES management subjected the analysts and designers to schedular pressures such that the quality of their work was compromised.

However, the NRC inspector noted that TES did not have documented instructions or procedures to assure that the technical qualifications (education, training, and related experience) claimed by newly hired permanent or contract employees conducting safety-related activities, was verified, stored with the status of a QA record, or that appropriate corrective action was taken when anomalies or inconsistencies were uncovered. TES management stated that appropriate procedures would be developed and implemented prior to June 30, 1982. This item will be followed during future inspections.

Detailed examination of the structural analyses, the resulting design modification drawings and their supporting stress calculations, and interviews with cognizant personnel, indicate that the allegations relative to use of inaccurate analytical models and erroneous input data to structural calculations were based on factual observations made during a 4-month period in early 1981.

With respect to the use of inaccurate analytical models, the NRC inspector determined that the analysts:

(1) used the structurally similar Millstone torus drawing to obtain needed dimensions as inputs to Pilgrim hydrodynamic scoping and analyses since all requisite Pilgrim data was not available at the time;

(2) changed the analysis techniques from a dynamic analysis to an allegedly equivalent static analysis without documented justification;

(3) used preliminary and undocumented hydraulic forces as inputs to the calculations;

(4) did not document the sources of design inputs nor assumptions in the calculation packages.

TES management stated that: (1) these deficiencies are unique to work related to the identified plants and, therefore, are not generic in nature; and (2) the proper Pilgrim dimensional data has already been incorporated into Pilgrim calculations.

In response to nonconformance B.2 above, TES committed to the following corrective actions: (1) the engineering justification for using a static analysis method would be documented; (2) all affected calculations would be redone using the latest GE-published hydraulic forces and applicable analyses methodology; (3) sources of design inputs and assumptions would be documented in the calculation packages; (4) all resulting design modification drawings and supporting stress calculations, including those previously transmitted to the affected plants would be reviewed and revised as needed.

The above actions will be completed by August 31, 1982.

One other nonconformance was identified in this area of the inspection. (See item B.3 above.) This area will be further examined during a future inspection.

Furthermore, the NRC inspector noted that Revision 0 of Technical Engineering Procedures TEP-2-004, TEP-3-002, TEP-3-003, TEP-6-008, and TEP-7-004 were not reviewed and approved by the QA Manager as required by section 3.2.1 of the QAM as evidenced by the lack of signature of the QA Manager on the subject procedures. Since later revisions of these, and other procedures, were reviewed in accordance with the QAM, and since the QA Manager agreed to document his review and approval of the subject procedures, no nonconformance was identified. This item will be followed in a future inspection.

3. QA Program Evaluation - The TES Corporate Policy Manual, Quality Assurance Manual, unique PQAP's, and the related detailed implementing procedures governing the areas of QA Program, organization,

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engineering control, procurement control, QA records, and audits were reviewed to determine that they were consistent with the quality and technical requirements that have been imposed on TES. The documentation of completed work in these areas, consisting of training records for 14 individuals, 1 management evaluation of the QA program, 8 internal QA audit files, 2 external QA audit files, qualification records for 2 audit team leaders, 4 purchase orders for TES services, 5 TES purchase orders to subcontractors, 3 drawing files, and applicable QA records, were examined to verify program implementation. Three nonconformances were identified in this area of the inspection. (See items B.1, B.4, and B.5 above.)

ORGANIZATION: TRANSAMERICA DELAVAL, INC.
ENGINE AND COMPRESSOR DIVISION
OAKLAND, CALIFORNIA

REPORT NO.: 99900334/82-01	INSPECTION DATE(S) 1/25-29/82	INSPECTION ON-SITE HOURS: 56

CORRESPONDENCE ADDRESS: Transamerica Delaval, Inc.
Engine and Compressor Division
ATTN: Mr. C. Mathews, General Manager
550 85th Avenue
Oakland, CA 94621

ORGANIZATIONAL CONTACT: Mr. R. E. Boyer, Manager, Quality Assurance
TELEPHONE NUMBER: (415) 577-7422

PRINCIPAL PRODUCT: Standby Diesel Generators

NUCLEAR INDUSTRY ACTIVITY: Commercial Nuclear Production of Transamerica Delaval, Inc., Oakland, California, of Standby Diesel Generators. 3000-13,000 HP totals 12% of total company production. Two contracts are presently in-house for current and future production.

ASSIGNED INSPECTOR: _____ _____
J. W. Sutton, Reactive & Components Program Section (R&CPS) Date

OTHER INSPECTOR(S): W. E. Foster, R&CPS

APPROVED BY: _____ _____
I. Barnes, Chief, R&CPS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B, and 10 CFR Part 21.

B. SCOPE: This inspection was made to review the status of previous inspection findings and also as a result of the issuance of 10 CFR 50.55(e) reports to the NRC pertaining to: (1) potentially defective valve springs in diesel generators that have been furnished to the following nuclear generating stations, (a) Bellefonte, Unit Nos. 1 and 2, (b) Hartsville A and B, Unit No. 2, and (c) Phipps Bend, Unit Nos. 1 and 2; and (2) a cracked
(Cont. on next page)

PLANT SITE APPLICABILITY:
Potentially Defective Valve Springs: 50-519, 50-521; 50-553, 50-554; 50-458; 50-400, 50-401, 50-402, 50-403.* Cracked Stud and Spherical Washers: 50-322; 50-416, 50-417; 50-206, 50-361, 50-362.* Inadequate Starting Air Check Valve:
(Cont. on next page)

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SCOPE: (Cont.) stud and three washers in the number two cylinder of the diesel generator that had been furnished to the Grand Gulf Nuclear Generating Station, Unit No. 1. The Engine and Compressor Division of Transamerica Delaval, Inc., had also issued 10 CFR Part 21 reports on the aforementioned items, as well as on a potential problem with a diesel generator starting air check valve.

PLANT SITE APPLICABILITY: (Cont.) 50-329, 50-330; 50-445, 50-446; 50-440, 50-441;* 50-438, 50-439;* 50-518, 50-519, 50-520, 50-521;* 50-553, 50-554.*
*Applicable plant unit not defined.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 16.7.1 of the QA Manual, QA Records were not being protected against fire, damage, or loss.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 7.3.1 of Section 7 of the QA Manual, a welder was observed welding without the applicable welding procedure being either in his possession, or having been issued in the job package as required by instructions.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50, Specification 100-A-3 and corrective action commitments, weld material was not returned to stores within the prescribed time period.

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Transamerica Delaval, Inc., commitment as stated in their letter of June 5, 1981, to NRC, the audit of the ASME Weld Shop had not been performed as committed.

5. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 4.4.3 of Section 4, dated February 27, 1981, of the Quality Assurance Manual, Betts Spring Company, a supplier of valve springs (major/critical), had not been surveyed a minimum of once every three years to assure their ability to comply with the specification requirements and to review the implementation of their quality program. This was evidenced by a Vendor Quality Program Survey (VQPS) form which had been completed February 25, 1976. An updated VQPS was received by TDI-ECD on January 27, 1982. This form is completed by the vendor and does not assure their ability to comply with specifications or review implementation of their quality program.

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6. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 6.1.3 of the Approved Supplier List (ASL) procedure, dated March 20, 1980, Associated Spring Company (Barnes Group) had been placed on the ASL, dated August 1981, prior to completion of a survey or audit as evidenced by an incomplete Audit Form, dated August 12, 1981. Additionally, a purchase order, dated October 21, 1981, ordered valve springs.

C. UNRESOLVED ITEMS:

1. The ASL, dated August, 1981, lists Associated Spring Company (Barnes Group), a new supplier, with the highest possible rating (10.0); however, no hardware had been received from them. The ASL procedure indicates that a supplier is rated according to the disposition of received hardware but it does not address how a numerical rating will be awarded to a new supplier.

   As a result of the foregoing, the inspector was unable to determine the validity of awarding a perfect rating to an unknown quantity; i.e., a vendor who has supplied no hardware, therefore, no history of received hardware.

2. The manufacturer (Melrose Spring and Tool Works) of defective valve springs had been excluded from the ASL, dated August 1981, as a source of supply for the valve springs. That action precludes receipt of defective springs from that source; however, the manufacturer was not performing a unique operation. There was no indication that Delaval had identified the cause of the problem.

   Based on the foregoing, it was not apparent that adequate measures had been taken to preclude recurrence.

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Deviation A (79-01) - Procedures and procedure manuals had not been established for the manufacturing and material control departments. The inspector verified by reviewing revised procedure manuals that the manuals now identify all departments that will maintain procedures and procedure manuals. The corrective action was taken prior to the stated completion date.

2. (Closed) Deviation B (79-01) - The vendor was not recording actual readings of measuring and test equipment undergoing periodic recalibration. The inspector verified by review of written instructions issued to supervision, and review of the revised IP 100 of the QA

Manual, that corrective action and preventive measures have been taken to prevent recurrence. The action was taken prior to the committed completion date.

3. (Closed) Deviation C (79-01) - The Qualified Suppliers List had not been updated monthly nor had a monthly summary of the quality rating of vendors been forwarded to QC and Purchasing.

   The inspector reviewed the revised issue of 1P 700 relating to the updating and issuance of the approved vendor summary to purchasing and other designated departments. Current lists and summaries indicate full compliance with the revised 1P 700 section of the QA Manual.

4. (Closed) Deviation D (79-01) - The activities, use and/or status of Corrective Action Requests (CAR) had not been reported by the Manager of Quality Control to the Division General Manager on a quarterly basis. The inspector verified that the Quality Control Manual had been revised to control the issuance of CAR activities to the Division General Manager. The new reporting requirements are contained in the QA and ASME Manuals. Section 14-1 and 15-1. The procedures are currently being implemented as required.

5. (Open) Deviation E (79-01) - The Document Control Center has not been protected against fire. The inspector verified that the vendor had purchased new cabinets and had transferred records to a microfilm system. During the inspector's review of the corrective action taken as a result of this deviation, it was noted that the current QA Manual Section 16.7.1, dated February 27, 1981, still requires the records to be protected from fire at Delaval. In addition, the Storage Cabinets for the microfilm are not rated as fireproof. (See Nonconformance B-1).

6. (Closed) Deviation F (79-01) - Audits of the Division Quality Assurance programs processes and procedures were not performed semiannually by Quality Engineering. The inspector verified that the Quality Assurance Manual, Section 17, dated February 27, 1981, had been revised to prevent recurrence of this item. Audits are now performed annually. Completed audits for 1980-1981 were reviewed for compliance.

7. (Closed) Deviation G (79-01) - Industrial Engineering had not reviewed, approved or disapproved Engineering Change Notices, Engineering Log not maintained and Drawing Change Requests had not been classified as major or minor. The inspector reviewed the corrective action taken by TDI to prevent recurrence. The Engineering Division Standard Prac-

tice Bulletin has been revised and reissued. The Engineering Change Notice Log had been revised and was being filled out as required. Current Change Notices were reviewed for compliance and were found to be acceptable. Compliance to the required changes were completed prior to the stated completion date.

8. (Closed) Unresolved Item (79-01) - Authority and dates of manufacturing and material control personnel performing activities affecting safety related functions had not been clearly established and delineated. The inspector verified that the current QA Manual clearly delineates the authority and duties of all personnel performing safety related activities.

9. (Closed) Deviation B (80-01) - Quality Engineering did not process a Corrective Action Request Form (CAR) for identified TDI failures to meet weld quality contract requirements in Diesel Engine Generator piping. The inspector verified by review of past and current issued corrective action requests that quality engineering is now generating CAR's as required by QA and contract requirements. In addition, the inspector reviewed documentation pertaining to the meeting held with all welding personnel on April 6, 1979. The corrective action was taken prior to the stated completion date.

10. (Closed) Deviation C (80-01) - TDI written practice 1P 600 did not describe procedure for examination of Level III personnel. Also, personnel performing visual examinations had not been qualified to methods covered by SNT-TC-1A documents. The inspector verified by review of documentation that corrective action had been taken to prevent recurrence of this item. 1P 600 has been revised and persons performing visual inspection have been requalified. Training sessions were held and documented for all personnel. Internal audits had been conducted to prevent recurrence. The corrective action had been taken prior to the stated completion date.

11. (Closed) Deviation D (80-01) - Welding was being performed by a welder in the 3G position who had been qualified for the 1G position only. The inspector verified by review of welder qualification records that all welders had been recertified to the 6G position. The current qualified welders were reviewed for compliance. Current welder certifications have been reviewed by the committee appointed for the task. Corrective action had been taken prior to the stated completion date.

12. (Open) Deviation E (80-01) - Unused weld rod was not being returned to the storage area within four hours of issuance. The inspector verified by review of documentation that all welders were notified of the required control of weld materials. Corrective Action Requests

were issued and control of weld materials were verified during an audit performed on March 27, 1981. A further instance was identified during this inspection of failure to return rods within four hours of issuance.

13. (Closed) Deviation F (80-01) - Welder identification and verification of welders not identified on Route Sheets. The inspector verified by review of Production Routing Sheets that welders are being properly identified and documented on Route Sheets. A CAR was issued and training sessions have been held. Internal audits have been performed of welding operations.

14. (Closed) Deviation G (80-01) - Defective weld removed and replaced without rejection and documentation on Inspection Report. The inspector reviewed documentation and corrective action taken to resolve this item. A CAR was issued to cover the repair - an ASME rework Record has been developed and is in use. Audits have been conducted.

15. (Closed) Deviation H (80-01) - Weld was observed to contain an area with less than a required ¼ inch fillet resulting from a fit-up condition. The inspector reviewed current inspection reports for compliance. A CAR was issued covering the above deviation. Training for NDE personnel was conducted and eye examinations were given to all NDE personnel.

16. (Closed) Deviation I (80-01) - Inspection acceptance stamps had not been entered for operations on the production sheet, nor had inspection reports been prepared to denote a rejected condition after inspection. The inspector verified that a CAR was issued to cover this item. Current jobs in progress were reviewed for compliance to 1P 500 requirements. Audits have been conducted for compliance.

17. (Closed) Unresolved Item B.4.d (80-01) - Discrepancies in dates that seismic tests to battery rack were conducted prevented a definite acceptance of the Seismic Report and Certification. The inspector verified that a corrective revision to the Seismic Analysis Report had been issued. The Seismic Test was run from January 1, 1979 to July 19, 1979. The original package was dated March 1979. A corrected certificate now indicates the correct date.

18. (Closed) Unresolved Item D.4.c (80-01) - Rework Tag No. R-0959 did not indicate by inspection if the work had been performed. The inspector reviewed documentation that indicated that the requirements of 1P 300 QA Section 14 are currently being followed. Rework tags are now being properly filled out.

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19. (Closed) Nonconformance A (80-01) - Welders using weld rod not approved for weld procedure. The inspector reviewed the corrective action taken by TDI to prevent recurrence. Training sessions were held with all welders. Each welder was issued his personal copy of weld procedures. The inspector verified that current weld procedures have been rewritten on a short form. These forms would be issued with the job package and used on all future jobs. The procedure would be in the possession of the welder. (See nonconformance B.2).

20. (Open) Nonconformance B (81-01) - Specification 100-A-3 requires all weld rod be returned to stores after four hours. The inspector reviewed the corrective action taken by TDI to prevent recurrence. Training sessions were held with welding personnel regarding return of weld material before the time limit had been exceeded. In addition, the weld issue room attendant was instructed to monitor the time out of weld rod. He would contact welders on a three hour schedule to prevent running over the four hour schedule. (See nonconformance B.3).

21. (Closed) Nonconformance C (81-01) - Welder observed welding out of procedure electrical parameters. The inspector verified that a CAR had been issued covering the item. A training session for all welders was held and documented. Welders were instructed in the use of welding procedures.

22. (Closed) Nonconformance D (81-01) - An identified nonconforming component had not been documented on the inspection report form or placed in bond. The inspector verified that corrective action reports had been prepared by TDI inspection personnel. A meeting with QC staff was held and documented. Current nonconformances have been documented and when required, placed in segregated areas. The audit of the weld department scheduled for the fall of 1981 had not been performed. (See nonconformance B.4).

23. (Closed) Nonconformance A (81-02) - The parts list and component drawings released by Engineering had not defined the acceptance criteria for the oil plugs. In addition, the installation instruction for the oil plugs contained no acceptance criteria. The inspector verified thru the review of revised drawings, corrective action requests, documentation of training of industrial engineering and engineering personnel, and a revised Route Sheet for the oil plug that corrective action, as stated in the TDI letter of October 6, 1981, was acceptable. The steps taken to prevent recurrence were considered acceptable.

24. (Closed) Nonconformance B (81-02) - Measures were not established to assure that tools used in the crankshaft oil plug installation are properly controlled and adjusted at specified periods to maintain accuracy within the necessary limits. The inspector reviewed the procedure and equipment used to install the oil plug. The tool used is a rolling type tool which is opened by use of hydraulic pressure. The final proof of the rolling operation is the leak test that is applied to the installed plug. The inspector reevaluated the nonconformance and determined that the tool is being controlled in a manner consistent with the requirements of 10 CFR Part 50 and the TDI QA Manual requirements.

25. (Open) Nonconformance C (81-02) - Records had not been maintained to furnish evidence that the motors for the auxiliary lube oil and jacket water pumps had been environmentally qualified. This item remains open for further NRC evaluation.

26. (Open) Nonconformance D (81-02) - Documentary evidence was not available to assure that the seller of the motors, for the auxiliary lube oil and jacket water pump had complied with the requirements of the purchase order. This item remains open for further NRC evaluation.

27. (Closed) Unresolved Item C.1 - Assembly/test Route Sheet inspection elements not signed off. The inspector reviewed the Route Sheets currently in use and found that they are being signed off as required by instructions. The current Route Sheets have been revised to prevent the recurrence of the above item. Acceptable corrective action and preventive measures have been taken.

E. OTHER FINDINGS OR COMMENTS

1. Follow up on 10 CFR Part 21 Reports

a. Potentially Defective Valve Springs (Associated, Betts and Connor) - Currently, there are three sources for valve springs, Part No. 03-360-02-OM. Purchase orders had been placed with Associated and Betts. A review of three vendor inspection reports (Form P-313), dated from February 24, 1978, through January 5, 1982, revealed that valve springs of the specific part number had not been received from Betts in 1979 and 1980. An unidentified, undated document indicated that TDI-ECD visited

Betts on July 24, 1981, for a plant tour. Prior to the close of this inspection, a completed Vendor Quality Program Survey form from Betts was received by TDI-ECD. This form was completed by Betts and does not assure their ability to comply with specifications or review implementation of their quality program. Associated was identified as a new supplier who had supplied no hardware. While the supplier of the defective springs (Melrose) had been excluded from the ASLNCSRE, dated August 1981, there was no apparent indication that TDI-ECD had taken adequate measures to assure that valve springs from current suppliers would not be defective.

b. Inadequate Starting Air Check Valve - The starting air check valve leaked during a seismic test at Structural Dynamic Research Corporation. The goal was a leakage rate of zero, however, the manufacturer (Wm. Powell Valve Co.) deemed that an unrealistic goal. Four valves had been returned to The Wm. Powell Valve Co., for rework and testing to the TCI-ECD newly established leak rate. Investigation is still underway; TDI-ECD submitted a revised 10 CFR Part 21 report on January 27, 1982.

c. Cracked Stud and Spherical Washers - The use of spherical washers in the piston assembly was discontinued in late 1976 to mid-1977. At that time, a new design using belleville washers was implemented. On December 31, 1980, TDI-ECD Service Information Memo No. 324 (among others) was distributed to all users of Model R and RV diesel engines below Serial Number 75080. That document provided instructions for modifying the piston assembly and replacing the spherical with belleville washers.

Several standby diesel generators have successfully undergone qualification tests subsequent to implementation of the design change.

d. Paragraph 21.21(b)(3), and its subparagraphs (vii) and (viii) of Title 10, Part 21, of the Code of Federal Regulations requires that the written report contain to the extent known: (1) corrective action which had been, is being, or will be taken; and (2) any advice related to the defect that had been, is being, or will be given to purchasers or licensees.

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The Transamerica Delaval, Inc. - Engine and Compressor Division's (TDI-ECD) 10 CFR Part 21 report, dated July 30, 1981, related to potentially defective valve springs, did not include that total (1) corrective action, and (2) advice given to purchasers or licensees. Specifically, (1) the supplier of the potentially defective valve springs was removed from the Approved Suppliers List, and (2) a letter to purchasers or licensees provided advice on recognition of the suspect valve springs.

2. Follow Up On A Regional Request

Mississippi Power and Light Company's 10 CFR Part 50.55(e) report, dated December 10, 1981, addressed the item discussed above (paragraph D.1.c). Additionally, the report identified the following deficiencies: (1) missing wrist pin keeper; (2) grooves in cylinder liners; and (3) excessive bearing wear and deterioration. TDI-ECD informed the inspector that these had been discussed during a Delivered Product Trouble meeting and determined to be workmanship problems. No documents were presented to substantiate that conclusion.

ORGANIZATION: UNITED ENGINEERS AND CONSTRUCTORS, INC.
PHILADELPHIA, PENNSYLVANIA

REPORT NO.: 99900510/82-02	INSPECTION DATE(S) 4/5-8/82 4/19-23/82	INSPECTION ON-SITE HOURS: 86

CORRESPONDENCE ADDRESS: United Engineers and Constructors, Inc.
ATTN: Mr. R. A. Curnane, Vice President
Project Support Operations
30 South 17th Street
Philadelphia, PA 19101

ORGANIZATIONAL CONTACT: Mr. J. B. Silverwood, QA Manager
TELEPHONE NUMBER: (215) 422-4744

PRINCIPAL PRODUCT: Architect Engineering Services

NUCLEAR INDUSTRY ACTIVITY: United Engineers and Constructors (UE&C) is the Architect Engineer on the following major projects: Seabrook, Units 1 and 2, and Washington Public Power Supply System, Unit 1 (WNP-1). Also, UE&C has active engineering service contracts on two nuclear plants for two utility clients.

ASSIGNED INSPECTOR: C J Hale Jr. 5/21/82
D. D. Chamberlain, Reactor Systems Section (RSS) Date

OTHER INSPECTOR(S): J. Conway, Reactive & Component Program Section
S. K. Chaudhary, Region I

APPROVED BY: C J Hale 5/21/82
C. J. Hale, Chief, RSS Date

INSPECTION BASES AND SCOPE:

A. BASES: UE&C Topical Report UEC-TR-001-5A, PSAR for the WNP-1 project and 10 CFR Part 50, Appendix B.
B. SCOPE: Status of previous inspection findings, follow up on items from the WNP-1 site inspection, inspection of UE&C Seabrook site design activities (interface between site design group and home office design group), and inspection regarding the following requests: (1) Region I request relating to a 50.55(e) report on WNP-1 regarding pipe support design errors and subsequent determination of similar errors on the
(cont. on next page)

PLANT SITE APPLICABILITY:

This inspection relates to the following plant dockets: 50-443/444, and 50-460.

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SCOPE: (Cont.) Seabrook project; (2) Region I request relating to UE&C audit of Grinnell Fire Protection System Company; and (3) 10 CFR Part 21 report for failure of UE&C to consider LOCA temperature effects in design of platform structural steel framing within containment (WNP-1).

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Appendix II of Topical Report UEC-TR-001-5A and Section 8.2 of ANSI N45.2.11, Administrative Procedure No. 15, Revision 14, Changes to Project Documents, allows "minor" design changes to be made without requiring the same review and approval as the original design document (Seabrook).

2. Contrary to Section 17.1.3.1 of Topical Report UEC-TR-001-5A and sections III and V of procedure GEDP-5, provisions were not being implemented for the preparation, review, and approval of a calculation on conduit and cable tray support weld adequacy (Conduit Support Calculation dated April 25, 1980).

3. Contrary to Criterion V of 10 CFR Part 50, Appendix B and Project Procedure No. 34, Project Change Requests after January 1981, and all Project Change Proposals for the WPPSS Nuclear Project No. 1 were not microfilmed.

C. UNRESOLVED ITEMS:

It was not apparent that the present tracking system for incorporation of design changes into design documents will assure that the required time limit (60 days) of procedure AP-15 will be adhered to.

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Nonconformance (81-03): The storage of QA records for the Seabrook Project was not meeting the intent of the storage requirements of ANSI N45.2.9, and audits of record storage areas were not being performed on a periodic basis.

The inspector selected three design drawings and three specifications from the Document Control Center System's Report and the Engineering-Purchasing Schedule, respectively. The inspector verified that each document was microfilmed and one copy 16 MM jackets for the specs and 35 MM aperture cards for the drawings, along with a hard copy are retained in file cabinets in the Document Control Center (DCC) located on the sixth floor of the UE&C building. A second copy of the microfilm is retained in file cabinets in the Record Retention Room (RRR) on the fourth floor.

The QAB of NRR has recently approved (ref. Haass/Ebiner letter, dated April 26, 1982) UE&C's dual storage facilities as meeting the requirements of ANSI N45.2.9, and this inspection has verified the satisfactory implementation of the storage requirements. Audit report NH-513, "Audit of Storage of QA Records," conducted on March 23-24, 1982, at the home office, the Boston office, Seabrook site, and Yankee Atomic Electric Company (Framingham, MA), was reviewed. This report satisfies the inspector's earlier concern and meets UE&C's commitment to audit quality-affecting activities on a yearly basis.

In inspecting the QA record activities relating to Seabrook, two instances of missing documents were noted: a hard copy of a specification was not in the file (DCC) and the date of removal and the individual who had removed it were not identified on the Document Custody Record Sheet; an aperture card of the latest revision of a drawing was not in the master aperture card file (RRR), and there was not documentation that the card had been removed. This area will be considered further during subsequent inspections.

2. (Closed) Nonconformances (81-03): The vendor surveillance file for two contracts on the Seabrook Project revealed that some witness points were not being accomplished or waived with justification. Based on these findings, UE&C committed to review all safety-related orders for Seabrook to complete the required vendor surveillance

The inspector verified that the Vendor Surveillance Branch of the Reliability & QA Department has reviewed the Seabrook contracts and identified those containing incomplete surveillance points. Certification of witness points on some of the questionable contracts have been completed. The remaining contracts will be completed in the future. Verification that these activities have been completed will be accomplished on a future inspection.

3. (Open) Nonconformance (82-01): The Reliability and Quality Assurance Department did not assure that the committed completion date was met for corrective action in response to a previous NRC inspection finding (item B.1, report 81-03).

   This item will remain open pending the review of UE&C response to the 82-01 inspection and review of corrective action. The response was not received in time to review prior to the 82-02 inspection.

4. (Open) Nonconformance (82-01): The transferring organization for three pipe stress analysis packages examined (WNP-1) did not verify that the latest revision of the Composite/System Piping Drawing and Fabrication and Erection Drawing was referenced on the analysis drawing.

   This item will remain open pending the review of UE&C response to the 82-01 inspection and review of corrective action. The response was not received in time to review prior to the 82-02 inspection.

5. (Closed) Unresolved Item (82-01): It was not apparent that program requirements were adequately defined and/or being followed in the preparation of nuclear pipe support design packages for transfer of responsibility to the WNP-1 site design group.

   Pipe Support Guideline PSG-1-1004, Nuclear Pipe Support Closeout Program, has been implemented and the requirements were being followed on nine pipe support packages examined.

E. OTHER FINDINGS OR COMMENTS:

1. WNP-1 Site Inspection Followup - As a result of the WNP-1 site inspection conducted on February 2-5, 1982, certain areas were identified for followup action at UE&C home office. The results of the followup action for each item is as stated below:

   a. The implementation of two new procedures (PP-47 and PSG-1-1004) were to be monitored during future NRC inspections. PSG-1-1004, Nuclear Pipe Support Closeout Program, has been implemented (D.5 above). PP-47, Closeout and Transfer of Design Documents, has not been implemented and UE&C management stated that they do not feel that PP-47 will be required. The NRC inspector examined two internal memoranda and field procedure FGCP-28, which address transfer of design documents to the field design group. An additional internal memorandum (AAC0259) was written during this inspection which describes the requirement for a receipt acknowledgement for any documents which transfer responsibility for continuing engineering from the home office

to field engineering. Each supervisory discipline engineer is required to maintain up-to-date records as to what responsibilities/documents have been transferred to the field. It was noted that FGCP-28 does not exactly match the present field organizational structure and UE&C management stated that a revision to FGCP-28 is in process. The review of the revised FGCP-28 will be referred to Region V for followup.

b. The backup calculations and documentation of verification of the cook book design document for cable tray support design and HVAC duct support design were examined, and the program requirements were being implemented.

c. The design review records for six System Design Descriptions (SDD's) were examined and checked against certain design documents. Program requirements for verification of SDD's were being implemented.

2. UE&C Seabrook Site Design Activities - This area of inspection was conducted as a result of a request from Region I to review UE&C Seabrook site design activities and the interface between UE&C site design and UE&C home office design. An inspection was conducted at the Seabrook site on April 5-8, 1982, followed by an inspection at UE&C Philadelphia office on April 19-23, 1982. The areas examined and results are discussed below:

a. Seabrook Site - The UE&C site engineering organizational structure and applicable procedures for control of design changes/documentation were examined. The organization and the design change procedure (AP-15) were revised early this year to provide better control of design changes and to provide faster response to construction problems. Twenty-two design change documents were examined to verify implementation of program requirements. A review was made of the UE&C interface with contractors in the HVAC duct support and the cable tray support areas. Two potential problem areas were referred to the Seabrook resident inspector for followup: (1) administrative problems with structural calculations performed on site; and (2) question of the adequacy of as-built information to be provided by the electrical contractor for cable tray supports.

Certain other items were identified for follow up at the UE&C Philadelphia office. The items/results are discussed in the following section.

b. UE&C Philadelphia Office - The follow up of the Seabrook site inspection items resulted in two nonconformances (B.1 and 2 above) and one unresolved item (C. above). The results of of the followup action are as stated below:

(1) The instructions for control/distribution of the change control log for tracking of design changes were reviewed and the control/distribution meets program requirements.

(2) The site/home office interface for control/distribution of Engineering Change Authorizations (ECA's) was reviewed. The distribution requirements are listed on the back of the ECA form. Every discipline gets a copy of all ECA's, and the responsible discipline for home office concurrence/action is identified by a code number which is a part of the ECA number. This area meets program requirements.

(3) The old program for control of field design changes used Interim Change Authorizations (ICA's) which allowed work to begin prior to completion of all analysis. Some of the ICA's indicated "MAG ANALYSIS" required, and this requirement was tracked by the change control log. The review of this area revealed that there are approximately 25 open ICA's that require "MAG ANALYSIS." The status of these ICA's will be reviewed during future inspections.

(4) The revised procedure for design change control (AP-15) requires "major" changes that are approved by the site design group to receive home office concurrence or no concurrence within 10 days. An attempt was made to determine how this will be controlled/tracked/accomplished by the home office design group and how the site design group is aware of concurrence status. UE&C management stated that this area is still being reviewed and that AP-15 would be revised to more clearly define responsibilities. This area will be reviewed further during a future inspection.

(5) During the review of HVAC duct support ECA's at the site, it was determined that a structural review of ECA's involving attachments to structural steel had not been required. The site group stated that the "Beam Verification Program" at the home office would pick up all attachments to structural steel. A review was conducted of the planned "Beam Verification Program," and the stated purpose of the program was to analyze each structural steel beam first with as-designed loading and later with as-built loads. The as-built program must be detailed enough to provide locations of attachments to structural steel. This program is just in the planning stages, and the program implementation will be followed during future inspections.

(6) The control of the 60-day, 3-ECA limit requirement of AP-15 for incorporation of design changes into design documents was reviewed and UE&C has a computer log (R) which tracks the number of outstanding changes by discipline. It was not clear how this tracking system will assure that changes are incorporated within the required time frame. This item is unresolved (C. above).

(7) Procedure AP-15, Changes to Project Documents, classifies changes as "major" or "minor." Major design changes require home office concurrence, but minor design changes only require site approval. A list was prepared by the site design group to identify the types of design changes that are "minor changes." The list of minor changes had no review and approval requirements and minor change ECA's could be prepared and approved by the responsible site engineer only. The area of "minor" design changes was identified as a nonconformance (B.1 above).

(8) A review was made of the verification of the cook book design document for cable tray support design. A nonconformance was identified relating to a calculation for weld sizing of cable tray support connections to structures (B.2 above).

(9) The site design group may produce preliminary calculations for their approval of ECA's, and these calculations must be forwarded to the home office for concurrence. If the home office uses the calculations performed by the site design group, they must assure that all program requirements

for calculations are satisfied. A Region I inspector accompanied the VPB inspector during this inspection, and the Region I inspector reviewed the area of site calculations for ECA's. It was determined that presently no site calculations have been used for home office concurrence of ECA's.

3. Pipe Support Design Errors (WNP-1/Seabrook) - This area of inspection resulted from a Region I request for follow up on a 10 CFR Part 50.55(e) report from WNP-1 regarding pipe support design errors and the subsequent determination of similar errors on the Seabrook project. The types of errors identified were minor human errors, failure to follow code requirements (e.g., weld sizing), failure to pick up change in design criteria of supplier, etc. The action taken by UE&C beginning in early 1980 includes:

   a. Generic:

      (1) UE&C issued formal size support design guidelines for use by all design personnel.

      (2) Formal checklists were instituted to be used for verification that critical design areas had been considered for individual pipe support designs.

      (3) Additional training was conducted for all pipe support design personnel.

   b. WNP-1 Project:

      (1) UE&C reviewed approximately 5,000 pipe supports which revealed about 1,700 with errors.

      (2) The 1,700 with errors were put on a "soft hold" which means that they can be installed but cannot be signed off.

      (3) The "soft hold" hangers are being given priority for release under the nuclear pipe support transfer program which corrects the errors identified.

c. Seabrook Project:

(1) UE&C sampled approximately 85 pipe supports out of 1,500 designed prior to February 1, 1980. The sampling revealed 24 with errors.

(2) A purchase order is in the process of being issued for a totally independent review of the remaining 1,500 pipe supports.

Although the action taken by UE&C, to date, appears adequate, due to time constraints during this inspection, the NRC inspector was not able to verify certain areas such as the training conducted, sampling of design performed after early 1980, other project work affected, etc. Therefore, this item will remain open pending review during a future inspection.

4. UE&C Audit Findings of Grinnell (Seabrook) - An examination of UE&C's external audit activities indicates that the Audit Branch and Project Quality (Boston office) of the Reliability & QA Department conducted a facility survey (March 1981) and three audits (July 1981 through March 1982) of Grinnell at their Providence, Rhode Island, office and their Cleveland-Rowen, North Carolina, fabrication plant. An evalution of these audit findings indicates satisfactory implementation of Grinnell's QA program for fabricating items for fire protection systems at the Seabrook facility.

5. 10 CFR Part 21 Report (WNP-1 and 4) - UE&C did not use the current design LOCA temperatures as they were not considered a design input requirement at the time the calculation for the structural steel supports were performed. Following the issuance of a 10 CFR Part 21 report in December 1981 on the above subject, Region V became concerned about a potential design change control problem at UE&C. Druing this inspection, several procedures addressing design control were reviewed to determine UE&C's interface requirements between the home office engineering group and the site engineering group.

For the WPPSS project, the site has the tracing for each drawing and can make design changes without home office approval. However, for the steel supports within containment, the home office was notified in writing of the connection changes made in the field for the embedded plates. These changes were utilized in the home office's updated calculations (i.e., considered LOCA temperature effects) for the steel supports. A review of several calculations indicated that an independent review was performed on each calculation. Proposed changes on some of the supports are also being verified by an independent laboratory (Lehigh Testing Company).

ORGANIZATION: UNITED ENGINEERS AND CONSTRUCTORS, INC.
PHILADELPHIA, PENNSYLVANIA

REPORT NO.: 99900510/82-01	INSPECTION RESULTS:	PAGE 10 of 10

Several Requests for Information (RFI), which include the calculations and subsequent changes to drawings, were sent to the site to update the applicable tracing. The revised drawing is microfilmed, and copies of the drawing and the microfilm are sent to the home office. Project Change Proposals (PCP) incorporating the appropriate RFI's were written. A PCP requires concurrence by the licensee prior to making any changes in the field.

For the Seabrook project, the "minor" changes that the field may make without home office approval are documented. Unlike the WPPSS project, the tracing of each drawing is retained in the home office.

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
ELECTRICAL SYSTEMS DIVISION
HUNT VALLEY, MARYLAND

REPORT NO.: 99900217/82-01	INSPECTION DATE(S) 4/19-22/82	INSPECTION ON-SITE HOURS: 24

CORRESPONDENCE ADDRESS: Westinghouse Electric Corporation
Electrical Systems Division
ATTN: Mr. J. F. Heins, General Manager
1111 Schilling Road
Hunt Valley, Maryland 21031

ORGANIZATIONAL CONTACT: Mr. R. W. Lee, Product Assurance Manager
TELEPHONE NUMBER: (301) 667-5532

PRINCIPAL PRODUCT: Electronic components and controls

NUCLEAR INDUSTRY ACTIVITY: About 75% of the manufacturing is commercial nuclear work. The product lines include Solid State Protection Systems, Nuclear Instrumentation Systems, Digital Rod Position Indication Systems, Reactor and Containment Vessel Level Monitoring Systems, and Technical Support Centers.

ASSIGNED INSPECTOR: W. M. McNeill — 6/1/82
W. M . McNeill, Reactive & Components Programs Section (R&CPS) — Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes — 6/1/82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: Manufacturing process control, control of special processes, audits, and status of previous inspection findings.

PLANT SITE APPLICABILITY:

Not Identified.

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
ELECTRICAL SYSTEMS DIVISION
HUNT VALLEY, MARYLAND

REPORT NO.: 99900217/82-01	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and section 9.0 of the Product Assurance Manual, no Quality Assurance Procedure was established which addresses the qualification of the wire wrap process and personnel.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and section 2.1 of Quality Assurance Procedure (QAP) 10.2, one of two operators performing Termi-point wiring on April 20, 1982, of a cabinet assembly 106E58G02, SN 0002, was found not to be certified in accordance with the procedure. No records could be found to demonstrate that the required training and testing had been accomplished.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and section 2.2.1 of QAP 13.3, although wire wrap was observed in the PC Board area on several boards, the applicable Process Specification (PS 82355 HA) was not maintained at the Inspection Station. The specification identified the acceptance criteria to be used by inspection.

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and section 3.1.1.1.(9) of QAP 14.6, Requests for Engineering Action (REA's) 342565 and 342566, were observed on serialized equipment which did not have the assigned serial numbers entered on the REA's.

5. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and section 2 of QAP 14.1, the procedure was found to be not fully implemented in that:

   a. The requirements of paragraph 3.1.1.3.13 of the procedure, pertaining to updating of tags, was not accomplished for Job No. 10477, part 1064E03, as of April 21, 1982, to reflect change order RN3088, which had been issued on March 23, 1982.

   b. Recording of all operators signatures and dates, which is a requirement of paragraph 3.2.1.1. of the procedure, was not accomplished on the tags for parts 1063E43G41, SN0001, and 1063E43G39, SN0001, for Job No. 10477.

c. Shortages (i.e., missing serial number stamping and missing brackets, and three power supplies) were not identified on the tag, as required by paragraph 3.2.1.4 of the procedure, for part 1063E43G39, SN0001 for Job No. 10477.

d. A Defective Article Report (DAR) number was not entered on the tags for part 6090D72G01, SN0005 for Job No. 10531, although required by paragraph 3.3.1.6.1 of the procedure. It was also noted that two nonapplicable REA's had been recorded on the tags.

C. UNRESOLVED ITEMS

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Nonconformance (81-02): Two Inspection Control Tags were found with incorrect and missing information. The inspector verified that the tags in question had been corrected and the departmental meetings were held as a preventive measure. This area was reinspected during this inspection and a nonconformance identified (see B.5).

2. (Closed) Nonconformance (81-02): Two Corrective Action Requests (CARs) for vendor nonconformances were either not initiated or were voided. A review of current MRB activities found no further problems in this area. The corrective action on the previous problems was implemented and an audit of the vendor is underway.

3. (Closed) Nonconformance (81-02): Three cases were found where defects were not logged or were logged incorrectly. An inspection of current Inspection Submittal and Discrepancy Records and nonconforming hardware found all defects properly logged. Training sessions had been held on this problem.

4. (Closed) Nonconformance (81-02): Independent verification of vendor test results has not been performed for the last 4 months. A review of the receiving inspection test report log found the procedure in question to be implemented. Internal memos were issued to implement the procedure requirements for independent verification.

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
ELECTRICAL SYSTEMS DIVISION
HUNT VALLEY, MARYLAND

REPORT NO.: 99900217/82-01	INSPECTION RESULTS:	PAGE 4 of 4

E. OTHER FINDINGS OR COMMENTS:

1. Manufacturing Process Control - The Inspection Control Tag procedure was reviewed and its implementation inspected. A sample of six parts and their associated tags were inspected in the PC board and wire assembly areas. In this area nonconformances B.4 and B.5 were identified. In regard to nonconformance B.4 it was noted that engineering had a date entered on the REA where a serial number should have been entered. In regard to nonconformance B.5 it was noted that the inspection of these units had had yet to be performed. Inspection is to identify the missing information RN, DAR, operator's signatures, shortages, etc.

2. Control of Special Processes - An inspection was performed of the various processes used at ESD - Hunt Valley. There were only three processes which required qualification of the process and/or personnel. Soldering, Termi-point, and wire wrap wiring were treated as special processes. A sister division at the same site, Integrated Logistic Support Division (ILSD), performed the qualification of personnel except Termi-point. The qualifications of eight operators were inspected. In this area nonconformances B.1 thru B.3 were identified. In regard to nonconformance B.1 it was noted that ESD - Hunt Valley had qualification procedures for soldering and Termi-point, however, there was no procedure on wire wrap. ILSD followed its own procedure to qualify the personnel. In regard to nonconformance B.3 it was noted that the specification in question was added to the file during the inspection.

3. Audits - The 1982 audit schedule was reviewed. The audit plans and checklists used for three recent audits were inspected. The reporting of results and follow up on findings were verified to follow established procedures. The training of three auditors used for the above sample was inspected. No nonconformances were identified in this area.

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This periodical covers the results of inspections performed by the NRC's Vendor Program Branch that have been distributed to the inspected organizations during the period from April 1982 through June 1982. Also included in this issue are the results of certain inspections performed prior to April 1982 that were not included in previous issues of NUREG-0040.

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QUARTERLY REPORT
JULY 1982 - SEPTEMBER 1982

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PREFACE

A fundamental premise of the Nuclear Regulatory Commission's (NRC) nuclear facility licensing and inspection program is that a licensee is responsible for the proper construction and safe operation of nuclear power plants. The total government-industry system for the inspection of nuclear facilities has been designed to provide for multiple levels of inspection and verification. Licensees, contractors, and vendors each participate in a quality verification process in accordance with requirements prescribed by, or consistent with, NRC rules and regulations. The NRC inspects to determine whether its requirements are being met by a licensee and his contractors, while the great bulk of the inspection activity is performed by the industry within the framework of sequential ongoing quality verification programs.

In implementing this multilayered approach, a licensee is responsible for developing a detailed quality assurance plan as part of his license application. This plan includes the quality assurance programs of the licensee's contractors and vendors. The NRC reviews the licensee's and contractor's quality assurance plans to determine that implementation of the proposed quality assurance program would be satisfactory and responsive to NRC regulations.

Firms designing nuclear steam supply systems, architect engineering firms doing design work on nuclear power plants, and certain selected vendors are currently inspected on a regular basis by the NRC. NRC inspectors, during periodic inspections, ascertain through direct observation of selected activities (including review of processes and selected hardware, discussions with employees and selected record review) whether a licensee or contractor is satisfactorily implementing a quality assurance program. If nonconformances with QA commitments are found, the inspected organization is requested to take appropriate corrective action and to institute preventive measures to preclude recurrence.

In addition to the QA program inspections, NRC also conducts reactive inspections of the licensee's contractors and vendors. These are special, limited scope inspections to verify that organizations supplying safety-related equipment or services to licensed facilities are exercising appropriate corrective/preventive measures when defects or conditions which could adversely affect the safe operation of such facilities are identified and that these organizations are complying with the NRC requirements which govern the evaluation and reporting of such conditions.

In the case of the principal licensee contractors, such as nuclear steam supply system designers and architect engineering firms, the NRC encourages submittal of a description of corporate-wide quality assurance programs for review and acceptance by the NRC Office of Nuclear Reactor Regulation (NRR). Upon acceptance by NRR, described quality assurance programs provide written bases for inspection on a generic basis, rather than with respect to specific commitments made by a particular licensee. Once accepted by NRR, a corporate quality assurance program of a licensee's contractor will be acceptable for all license applications that incorporate the program by reference in a Safety

Analysis Report. In such cases, a contractor's quality assurance program will not be reviewed by NRR as part of the licensing review process, provided that the incorporation in the SAR is without change or modification. However, new or revised regulations, Regulatory Guides, or Standard Review Plans affecting quality assurance program controls may be applied by NRR to previously accepted quality assurance programs.

The NRC Region IV Office In Arlington, Texas, inspects the implementation of quality assurance programs of nuclear steam supply system designers and architect engineering firms which have been submitted to, and approved by, NRR in the form of Topical Reports or Standardized Programs. Upon completion of inspections confirming satisfactory implementation of QA programs, NRC will issue a confirming letter to the nuclear steam system supplier or architect engineering firm.

Licensees and applicants that have referenced the NRR approved Topical Report, or Standardized Program, in Safety Analysis Reports (or have adopted the total quality assurance program described in the Topical Report or Standardized Program) may, at their option, use the confirming letter to fulfill their obligation under 10 CFR Part 50, Appendix B, Criterion VII, that requires them to perform initial source evaluation audits and subsequent periodic audits to verify quality assurance program implementation. For additional details concerning the NRC letter, refer to "SAMPLE LETTER" included in this report.

Licensees or construction permit holders may choose not to make use of a contractor's NRC accepted program, or such an accepted program may not exist. In such cases, the Region IV inspections of nuclear steam supply system designers, architect engineering firms, or other licensee contractors, sub-tier contractors, or suppliers, will be based on programs developed to meet the commitments made by the licensee or construction permit holder. These Region IV inspections will not relieve the licensees or applicants from any inspection/verification responsibilities required by Criterion VII.

The NRC currently is continuing their evaluation of a proposed program for NRC acceptance of third-party (ASME) certification of Vendor Quality Assurance programs. Should the proposed program be endorsed by NRC, it is anticipated that, subject to NRC audits of the third-party program, licensees and applicants would be able to use the ASME nuclear certification and inspection system to fulfill that part of their obligation under 10 CFR Part 50, Appendix B, Criterion VII, which required them to perform initial source evaluation/selection audits and subsequent periodic audits to assess the quality assurance program implementation.

A third party category of firms consists of organizations whose quality assurance programs or manufacturing processes have not been reviewed and approved by NRR, or by a third party (such as ASME). This category of firms is subject to NRC inspection based on the safety significance and performance of products or services provided by such firms. Since such firms will not receive a third-party review of their QA programs, results of the direct NRC inspections may not be used to fulfill the licensees's obligations under Criterion VII.

The White Book contains information normally used to establish a "qualified suppliers" list; however, the information contained in this document is not adequate, nor is it intended to stand by itself as a basis for qualification of suppliers.

Correspondence with contractors and vendors relative to the inspection data contained in the White Book is placed in the USNRC Public Document Room, located in Washington, D.C.

Copies of the White Book may be obtained at a nominal cost by writing to the National Technical Information Service, Springfield, Virginia 22161.

ORGANIZATION: COMPANY, DIVISION
CITY, STATE

REPORT NO.: Docket/Year Sequence	INSPECTION DATE(S)	INSPECTION ON-SITE HOURS:

CORRESPONDENCE ADDRESS: Corporate Name
Division
ATTN: Name/Title
Address
City/State/Zip Code

SAMPLE PAGE
(EXPLANATION OF FORMAT AND TERMINOLOGY)

ORGANIZATIONAL CONTACT: Name/Title
TELEPHONE NUMBER: Telephone Number

PRINCIPAL PRODUCT: Description of type of components, equipment, or services supplied.
NUCLEAR INDUSTRY ACTIVITY: Brief statement of scope of activity including percentage of organization effort, if applicable.

ASSIGNED INSPECTOR: Signature _____ _____
Name/VPB Section Date

OTHER INSPECTOR(S): Name/VPB Section

APPROVED BY: Signature _____ _____
Name/VPB Section Date

INSPECTION BASES AND SCOPE:

A. BASES: Pertain to the inspection criteria that are applicable to the activity being inspected, i.e., 10 CFR Part 21, Appendix B, and SAR or Topical Report commitments.

B. SCOPE: Summarizes the specific QA program areas that were reviewed, and/or identifies plant systems, equipment or specific components that were inspected. For reactive (identified problem) inspections, the scope summarized the problem that caused the inspection to be performed.

PLANT SITE APPLICABILITY: Lists docket numbers of licensed facilities for which equipment, services or records were examined during the inspection.

ORGANIZATION: COMPANY, DIVISION
CITY, STATE

REPORT NO.:	INSPECTION RESULTS:	PAGE 2 of 2

A. VIOLATIONS: Shown here are any inspection results determined to be in violation of Federal Regulations (such as 10 CFR Part 21) that are applicable to the organization being suspected.

B. NONCONFORMANCES: Shown here are any inspection results determined to be in nonconformance with applicable commitments to NRC requirements. In addition to identifying the applicable NRC requirements, the specific industry codes and standards, company QA Manual sections, or operating procedures which are used to implement these commitments may be referenced.

C. UNRESOLVED ITEMS: Shown here are inspection results about which more information is required in order to determine whether they are acceptable items or whether a Violation or Nonconformance may exist. Such items will be resolved during subsequent inspections.

D. STATUS OF PREVIOUS INSPECTION FINDINGS: This section is used to identify the status of previously identified Violations, items or Nonconformance and/or Unresolved Items until they are closed by appropriate action. For all such items, and if closed, include a brief statement concerning action which closed the item. If this section is omitted, all previous inspection findings have been closed.

E. OTHER FINDINGS OR COMMENTS: This section is used to provide significant information concerning the inspection areas identified under "Inspection Scope." Included are such items as mitigating circumstances concerning a Violation or Nonconformance, statements concerning the limitations or depth of inspection. (Sample Size, type of review performed) and special circumstances or concerns identified for possible follow up. For reactive inspections, this section will be used to summarize the disposition or status of the condition or event which caused the inspection to be performed.

SAMPLE PAGE
(EXPLANATION OF FORMAT AND TERMINOLOGY)

CONTRACTORS WITH NRC LETTERS CONFIRMING QA PROGRAM IMPLEMENTATION

(SEE NEXT PAGE FOR EXAMPLES OF CONFIRMING LETTERS)

CONTRACTOR	TOPICAL REPORT	REVISION	DATE OF NRC LETTER
BABCOCK & WILCOX	BAW 10096A	REVISION 1	DECEMBER 30, 1975
STONE & WEBSTER	SWSQAP 1-74	REVISION A	DECEMBER 30, 1975
WESTINGHOUSE NTD	WCAP-8370	REVISION 9A	APRIL 30, 1981
BECHTEL-GAITHERSBURG	BQ-TOP-1	REVISION 2A	MARCH 16, 1981
BECHTEL-SAN FRANCISCO	BQ-TOP-1	REVISION 3A	JUNE 12, 1981
EBASCO SERVICES, INC.	ETR-1001	REVISION 8A	MARCH 31, 1980
COMBUSTION ENGINEERING	CENPD-210-A	REVISION 3	JUNE 2, 1981
GIBBS & HILL, INC.	GIBSAR 17-A	AMENDMENT 2	MARCH 31, 1977
UNITED ENGINEERS & CONSTRUCTORS	UEC-TR-001-3A	AMENDMENT 5	MARCH 31, 1977
GENERAL ELECTRIC CO.	NEDO-11209-04A	N/A	MARCH 30, 1977
SARGENT & LUNDY ENGINEERS	SL-TR-1A	REVISION 5	MAY 17, 1979
BECHTEL-LOS ANGELES	GQ-TOP-1	REVISION 2A	JUNE 5, 1979
GILBERT-COMMONWEALTH	GAI-TR-106	REVISION 2A	FEBRUARY 2, 1981
BECHTEL-ANN ARBOR	BQ-TOP-1	REVISION 2A	MAY 7, 1981

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TEXAS 76012

(ADDRESSEE)

Gentlemen:

A series of Nuclear Regulatory Commission (NRC) inspections have been conducted to review your implementation of the Quality Assurance Program applicable to NRC applicants or licensees who have contracted for services from the (applicable corporate entity). These inspections consisted of selective examination of procedures and representative records, interview of personnel, and direct observation by the inspectors. As a result of these inspections, the NRC has concluded that the QA program described in Topical Report _____ is being implemented satisfactorily. Neither this conclusion nor the remainder of this letter applies to manufacturing activities or construction related activities conducted at reactor sites.

Licensees and applicants that have referenced the above Topical Report in their Safety Analysis Reports (or have adopted the total quality assurance program described in that Topical Report) may, at their option, use this letter to fulfill their obligation under 10 CFR Part 50, Appendix B, Criterion VII, that requires them to perform initial source evaluation/selection audits and subsequent periodic audits to assess the quality assurance program implementation.

The NRC expression of satisfaction with the implementation of your QA program does not assure that a specific product or service offered by you to your customer is of acceptable quality, nor does it relieve the applicant or licensee from the general provision of Criterion VII which requires verification that purchased material, equipment, or services conform to the procurement documents. It is recognized that in some cases this assurance can be made by the applicant or licensee without audits or inspections at your facility.

Continuing acceptability of implementation of your QA program is contingent upon your maintaining a satisfactory level of program implementation, certified through periodic NRC inspection, throughout all corporate organization units and nuclear projects encompassed by your program. Should your program implementation at any time be found unacceptable you will be notified by letter and requested to correct the deficiencies promptly. In the

event you fail to correct the deficiencies promptly, or if the record of deficiencies is such as to indicate generally poor program implementation, you and the applicants and licensees who have referenced your QA program will be notified that the generic implementation of your program is no longer acceptable to the NRC. All of the audit/inspection requirements of Criterion VII, Appendix B, 10 CFR Part 50, must then be implemented by the applicants or licensees. The NRC will reinstate its letter of acceptability of implementation of your QA program only after our inspectors have concluded, based on reinspection, that you have again demonstrated full compliance.

Except as noted above, the conclusions expressed in this letter will be effective for three years from the date of issue of the letter. At that time, program performance over the previous three year period will be evaluated and this letter reissued, if appropriate.

The results of our inspection are published quarterly in the Licensee Contractor and Vendor Inspection Status Report (NUREG 0040), which is made available to NRC facility applicants, licensees, contractors, and vendors, as well as to members of the public, by subscription.

Sincerely,

Regional Administrator

ORGANIZATION: AIRCO WELDING PRODUCTS
ARCRODS PLANTS
SPARROWS POINT, MARYLAND

REPORT NO: 99S 0774/82-01	INSPECTION DATE(S) May 17-21, 1982	INSPECTION ON-SITE HOURS: 56

CORRESPONDENCE ADDRESS: AIRCO Welding Products
Arcrods Plants
ATTN: Mr. J. J. Heidelmaier, Manager, QA
P. O. Box 6686
Sparrows Point, MD 21219

ORGANIZATION CONTACT: Mr. David C. Nenstiel, QA Engineer
TELEPHONE NUMBER: (301) 477-3300 Ext.245

PRINCIPAL PRODUCT: Welding filler metals

NUCLEAR INDUSTRY ACTIVITY: The Arcrods Plants' nuclear product is approximately 1% of their 150×10^6 lb. of filler metals produced per year.

ASSIGNED INSPECTOR: I. Barnes 8-4-82
for J. Conway, Reactive and Components Program Section (R&CPS) Date

OTHER INSPECTOR(S): D. Norman, R&CPS

APPROVED BY: I. Barnes 8-4-82
I. Barnes, Chief, R&CPS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B; and 10 CFR Part 21.

B. SCOPE: This inspection was made as a result of a potential 10 CFR Part 50.55(e) notification which reported coated stainless steel welding rods mislabeled as E-7018 carbon steel rods. The notification was made by Baldwin Associates at the Illinois Power Company, Clinton Station site, Clinton, Illinois. In addition to reviewing AIRCO'S implementation of Baldwin Associates' corrective action recommendations (cont. on next page)

PLANT SITE APPLICABILITY:

Incorrect welding filler metal - Docket Nos. 50-461/50-462/50-395

ORGANIZATION: AIRCO WELDING PRODUCTS
ARCRODS PLANTS
SPARROWS POINT, MARYLAND

REPORT NO: 99900774/82-01	INSPECTION RESULTS:	PAGE 2 of 4

SCOPE: (cont.)
to prevent recurrence of the reported problem, the following areas were inspected: organization (training/certification), procurement, document control, process and material control, inspection, handling/storage/shipping, calibration, housekeeping, nonconformance, corrective action, special processes, records, and audits (internal/external).

A. VIOLATIONS:

Contrary to Section 21.21 of 10 CFR Part 21, required documentation or procedures were not available to provide for the evaluation of deviations or for notification of the licensee or purchaser of uncorrected deviations.

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50, established procedures (ref. Cleveland/Sparrows Point memo dated March 9, 1982) addressing the handling of Military/Nuclear Core Wire, and QAB 1-81 "Handling of Tote Cans" (September 14, 1981), inspection of a designated hold-area for in-process Military/Nuclear material revealed the following:

   a. Approximately 20 tote cans out of a total of 49 did not contain proper identification to indicate that the cans had been inspected to detect any residual wire prior to filling the cans.

   b. One can did not contain a Military/Nuclear identification tag.

   c. Three cans did not contain covers.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 2.1.9 of QAI 16.1.1, a review of an internal audit of the Cleveland facility indicated that Sparrows Point QA personnel had not verified the implementation of corrective action relating to handling of Military/Nuclear wire at the Cleveland facility.

3. Contrary to Criterion V of Appendix 3 to 10 CFR Part 50 and Sections 2.1.3 and 2.2.1 of QAI 2.4.1, a review of QA personnel records indicated that six individuals had not been indoctrinated and trained in all aspects of the QA program.

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 2.4.2 of QAI 7.1.1, a review of the Vendor Quality Survey Report (VQSR) from 1978 thru March 1982 revealed that six suppliers were not audited yearly and/or resurveyed once every 3 years.

5. Contrary to Criterion V of Appendix B to 10 CFR Part 50, Section 3.7.1 of QAP 3.1 and Sections 2 and 3.2.1 of QAP 6.1, a review of Weld Test Reports revealed that a welding procedure for shielded metal arc welding of Cr-Mo weld metals was not at the designated welding station.

6. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 2.4 of QAP 14.1, a review of eight internal audit reports from October 1979 through February 1982 revealed that management's response to many audit deficiencies did not address the cause and long term corrective action to preclude repetition of the conditions adverse to quality.

7. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 2.1.1 a of QAI 14.1.2, a review of the QA/QC Stamp Log indicated that the inspectors had not dated the log as required.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

None, this was the initial inspection.

E. OTHER FINDINGS OR COMMENTS:

A detailed review of documentation (e.g., QA manual, procedures, instructions, bulletins, training and qualification records, purchase orders, nonconformance reports, inspection records, audit reports, etc.) led to the identification of seven nonconformances (B of above) and the following findings:

1. Corrective Action - Following the discovery at Clinton Station of the stainless steel electrode which was identified as low hydrogen mild steel, Baldwin Associates conducted an inspection of AIRCO's facility at Sparrows Point in February 1982 to verify the implementation of AIRCO's QA program and to observe special weld tests of E309 wire with an iron powder flux (low hydrogen E7018) coating. The inspection

resulted in five corrective action recommendations, three of which were verified by the NRC inspector as being implemented. Nonconformances B.1 and B.2 above addressed one of the corrective actions; i.e., handling of tote-cans. Two of the corrective actions were under investigation by Manufacturing Engineering. This item will be reviewed further during a future inspection.

2. QA Organization - The QA Organizational Chart, Figure 1.1-4 of QAP 1.1, Revision 1, shows the Material Handler and Quality Control Inspectors reporting to the QA Engineer. As implemented, this chart applies during military and nuclear production runs which amounts to approximately 3% of total production. During commercial production runs, the personnel, except for one lead inspector, report to production management.

A request was made by AIRCO to ASME on July 9, 1979, for concurrence of the organization with personnel assigned dual functions in Quality and Production. ASME responded on August 22, 1979, that a decision on the acceptability of the organization would be made during the upcoming survey of AIRCO for recertification of the Quality System Program. The survey was performed and a Quality System Certificate was issued on December 7, 1979; however, there is no evidence to indicate that the organization was reviewed or discussed with AIRCO. The organization chart (Figure 1-1.4) and the text of QAP 1.1 do not adequately describe the existing organization. This item will be reviewed further at a future inspection.

ORGANIZATION: AMERICAN WARMING AND VENTILATING, INC.
MAUMEE, OHIO

REPORT NO.: 99900733/82-01	INSPECTION DATE(S) 4/26-30/82	INSPECTION ON-SITE HOURS: 51

CORRESPONDENCE ADDRESS: American Warming and Ventilating, Inc.
ATTN: Mr. W. B. Ball, Jr.
President
1310 Indian Wood Circle
Maumee, OH 43537

ORGANIZATIONAL CONTACT: Mr. D. E. Sloan, Manager-Quality Assurance
TELEPHONE NUMBER: (419) 893-5011

PRINCIPAL PRODUCT: Isolation Dampers.

NUCLEAR INDUSTRY ACTIVITY: Less than 10%.

ASSIGNED INSPECTOR: J. T. Conway for — 6-25-82
W. E. Foster, Reactive & Component Program Section (R&CPS) — Date

OTHER INSPECTOR: L. B. Parker, R&CPS

APPROVED BY: J. T. Conway for — 6-25-82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21 and 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made as a result of the issuance of 10 CFR Part 21 reports pertaining to: (1) incorrect springs and nomographs for ITT General Control Actuators; and (2) improper workmanship and design of some electrical wiring connections. The reports and their revisions identified 8 nuclear stations and 13 units. In conjunction, with these 10 CFR Part 21 reports, some 10 CFR Part 50.55(e) reports had been issued. Additionally the
(cont. on next page)

PLANT SITE APPLICABILITY: Docket Nos. 50-456, 457; 50-454, 455; 50-354, 355; 50-373, 374; 50-352, 353; 50-438, 439; and 50-334, 412.

ORGANIZATION: AMERICAN WARMING AND VENTILATING, INC.
MAUMEE. OHIO

REPORT NO.: 99900733/82-01	INSPECTION RESULTS:	PAGE 2 of 7

SCOPE: (Cont.) following areas were inspected: (1) status of previous inspection findings; (2) change control; (3) manufacturing process control; and (4) implementation of 10 CFR Part 21.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraph 1.1, its subparagraph 1.1.1 and paragraph 1.2 of Quality Assurance Section No. S-300, Revision 1, dated November 27, 1974, and the Quality Control Calibration Schedule, Revision 4, dated October 16, 1981, wire crimper, No. 59170, Model AH located at the Waldron facility, had not been included in the calibration schedule as evidenced by its lack of: (1) serialization; (2) a tool inspection history card; and (3) a calibration status label. (See paragraph E.3.a).

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraphs 7.1.2, 7.2.5, 8.1, and subparagraph 8.1.2 of Quality Assurance Procedure No. P-180, Revision 2, dated November 21, 1980:

   a. Removal of voided documents had not been accomplished at the Waldron plant, as evidenced by the inclusion of superseded sheets in the Fabrication Instructions for American Warming and Ventilating (AWV) Job No. 90247. For example, the Fabrication Instructions included: (1) sheets 1 of 11 and 1 of 12, dated March 7, 1980, and March 4, 1982, respectively; (2) two 3 of 12 pages, dated March 4, 1982, and April 8, 1982.

   b. The voided copy of QA Section No. S-100 (Revision 2, dated August 1, 1979) at the Waldron plant had not been returned, recorded, and destroyed, as evidenced by its presence in the QA Manual.

      The latest document was Revision 3, dated April 19, 1982 (latest approval date). The QA Manual at the Waldron plant did include other documents that had been revised as late as April 19, 1982.

c. A written confirmation of approval, via ECN or QAIOM, had not been transmitted within a 2-day period for the verbally requested and approved changes made to the following drawings on February 26, 1982: (1) 15716, Revision B, dated December 21, 1981; and (2) 15717, Revision B, dated December 21, 1981. The drawings were located at the Waldron plant and were for Job No. 90247.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraph 4.1, and its subparagraphs 4.1.1, 4.1.2, and 4.1.3, of Engineering Procedure No. EP1225, Revision 1, dated December 26, 1979 (Approved June 12, 1980), "revised by" information (initials) had not been recorded on the reverse side of the drawing number card for Revision C, dated April 25, 1982, of Drawing No. 80343-009-000.

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Note 8 of AWV Drawing No. 14441-20, Revision H, dated October 5, 1981:

   a. NAMCO Thread Sealant Kit EH 459-20000 was not used to seal the electrical conduit of a NAMCO Snap-Lock Limit Switch (EA 18031302) installed on a backdraft isolation damper for Hope Creek generating station (AWV Order No. 90192).

   b. NAMCO Procedure EH459-20000 was not available for use during installation of the above switch at the Waldron facility.

5. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 1.2 of QA Section No. S-140, Revision 2, AWV design documentation did not contain NAMCO switch installation instructions.

6. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and paragraph 4.2 of QA Procedure No. P-361, Revision 0, dated February 6, 1979, a report and a written evaluation had not been initiated in the case of the following known deficiencies:

   1. An AWS (February 6, 1980) 10 CFR Part 21 notification to the NRC concerning ITT AH90 Series or NH90 Series Hydramotor Electro-hydraulic Actuator.

   2. An AWV (May 6, 1980) 10 CFR Part 21 notification to the NRC concerning wiring connection defects.

3. The mounting tab and fusible link fire damper deficiency identified by Mississippi Power and Light Company in their PRD-81/05 report, filed under 10 CFR Part 50.55(e).

C. UNRESOLVED ITEMS:

While evaluating the implementation of corrective actions and preventive measures related to crimped terminals of wiring harnesses, at the Waldron facility; it was not apparent that: (1) operators and inspectors had been trained; (2) instructions had been provided for manufacturing, inspecting, and testing harnesses; and (3) records had been maintained for the aforementioned activities.

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Nonconformance A (81-01): Failure to use Form-200-3 when corrective action measures were requested from Advanced Air, Inc.

   A form F-200-3 was initiated for both types of fusible link deficiencies, which were verified by the inspector.

2. (Closed) Nonconformance B (81-01): Failure to immediately notify QA manager of a defect.

   Corrective action was accomplished by instruction of appropriate personnel through an interoffice memorandum (IOM). This IOM, originated by the QA manager, on December 21, 1981, stated in part ". . . In order to provide you [management personnel] with those specific instructions/ directions, attached are copies of 10 CFR Part 21 and AWV's internal procedure P-361. These along with our past experiences should answer any questions you may have concerning 10 CFR Part 21 reporting requirements. If not, please advise any questions via IOM. If no questions are received that will indicate acknowledgement of review." The inspector questioned the capability of verifying this type of an acknowledgement. The AWV QA Manager responded to the question by obtaining the required managerial signatures on an IOM dated April 27, 1982, stating that management had received and reviewed the 10 CFR Part 21 reporting requirements distributed by the IOM of December 12, 1981.

ORGANIZATION: AMERICAN WARMING AND VENTILATING, INC.
MAUMEE, OHIO

REPORT NO.: 99900733/82-01	INSPECTION RESULTS:	PAGE 5 of 7

E. OTHER FINDINGS OR COMMENTS:

1. Follow up on Requests (Regional and Headquarters) -

a. American Warming and Ventilating, Incorporated (AWV) filed a 10 CFR Part 21 report on May 6, 1980. The report related to defects in some wiring connections in isolation dampers that had been supplied to: (1) Limerick Generating Station, Units 1 and 2; (2) Susquehanna Steam Electric Station, Units 1 and 2; and (3) Midland. An AWV letter dated September 18, 1980, to the Nuclear Regulatory Commission withdrew reference to Midland because the supplied hardware was not safety-related.

Records of rework and reinspection of wiring harnesses for the isolation dampers furnished for Limerick were reviewed. It is concluded that corrective action is adequate. Records for correction of the identified problem related to Susquehanna were not available; therefore, this aspect will remain open and will be evaluated during a future inspection. Preventive measures were not adequate inasmuch as they had not been implemented regarding ongoing work. For example, two 26 inch diameter back-draft isolation dampers had been wired since October 16, 1981, (based upon date of drawing for wiring) at the Waldron facility. However, it was not apparent that: (1) operators and inspectors had been trained; (2) instructions had been provided for manufacturing, inspecting, and testing harnesses; and (3) records had been maintained for the aforementioned activities. Further, it was determined that: (1) records of evaluation of the defect had not been maintained; and (2) crimpers used to terminate wiring had not been placed under the calibration program. See paragraphs B.1, B.6, and C.

b. In response to an NRC Headquarters request to ascertain that all corrective actions had been completed by AWV with respect to the 10 CFR Part 21 notifications concerning ITT General Controls Actuators with defective spring material and nomographs which could be interpreted incorrectly, the AWV files on shop order 90193, Ebasco, St Lucie No. 2, and 90235, Bechtel, Midland, were examined. In both cases, it was determined that the dampers which were delivered to the sites were evaluated and separated in three categories; use as is, repair, and replace. All dampers listed were accounted for and those requiring replacement and repair were replaced and repaired. Also, measures were taken to prevent recurrence.

ORGANIZATION: AMERICAN WARMING AND VENTILATING, INC.
MAUMEE, OHIO

REPORT NO.: 99900733/82-01	INSPECTION RESULTS	PAGE 6 of 7

c. The Mississippi Power and Light (MP&L) 50.55(e) report, which initiated this item, has been properly closed by MP&L PRD 81/05, Final Report, Mounting Tab and Fusible Link Fire Damper Deficiency. Other sites are affected by this deficiency.

2. Programmatic Areas -

a. Change Control - This aspect of the inspection involved: (1) the review of 15 requirement documents; and (2) evaluation of implementation as reflected by 4 drawing control cards with 13 entries; 2 travelers; 5 drawings; and 3 procedures. This effort revealed that: (1) superseded sheets had not been removed from Fabrication Instructions; (2) a superseded section had not been removed from a QA Manual; (3) written confirmation of approval had not been transmitted within the 2-day period; and (4) an entry on the reverse side of a drawing control card had not been initialled. See paragraph B.2 and B.3.

b. Manufacturing Process Control - Ten Fabrication Instructions for six different Shop Numbers were inspected for completeness. They were found to have all inspection points complete and heat numbers, where required. One shop order had several Fabrication Instructions available for one item number. Inspection of back-draft isolation dampers for the Hope Creek Generating Station (Job. No. 90192) revealed that the electrical conduit had not been installed as required by Note 8 of Drawing No. 14441-201. See paragraph B.4. Also product recommendations had not been translated into specific AWV design documents. See paragraph B.5.

c. Implementation of 10 CFR Part 21 - The inspector observed posting of procedures in accordance with 10 CFR Part 21 at both the Maumee and Waldron facilities. Management had failed to initiate evaluation reports in accordance with AWV procedure. See paragraph B.6.

3. Contractor Actions During the Inspection - Prior to the close of the inspection, the inspector was provided a copy of:

a. A newly created Quality Control Tool Inspection History Card for the crimping tool. It was not verified, however, that: (1) the card had been included in the file; (2) a calibration status label had been affixed to the crimper or its container; and (3) the crimper had been serialized.

ORGANIZATION: AMERICAN WARMING AND VENTILATING, INC.
MAUMEE, OHIO

REPORT NO.: 99900732/82-01	INSPECTION RESULTS:	PAGE 7 of 7

b. An interoffice correspondence, dated April 28, 1982, transmitted another copy of S-100, Revision 3, to the Waldron plant. It was not verified, however, that the document had been incorporated into the QA Manual at Waldron.

c. A Quality Audit Evaluation (QAE) report, dated April 29, 1982. The report indicates that 30 additional drawing number cards were reviewed with no further deficiencies being observed. The deficient card was corrected and is deemed an isolated event with preventive measures being unnecessary. However, as indicated by the QAE report, "Compliance to EP-1225 to be reviewed and verified during the 1982 internal audit." This item is considered closed with no further written response required.

ORGANIZATION: THE BABCOCK AND WILCOX COMPANY
NUCLEAR POWER GENERATION DIVISION
LYNCHBURG, VIRGINIA

REPORT NO.: 99900400/82-02	INSPECTION DATE(S) 5/17-21/82	INSPECTION ON-SITE HOURS: 38

CORRESPONDENCE ADDRESS: The Babcock and Wilcox Company
Nuclear Power Generation Division
ATTN: Mr. D. E. Guilbert, Vice Pres. & Gen. Mgr.
P. O. Box 1260
Lynchburg, VA 24505

ORGANIZATIONAL CONTACT: Mr. E. L. Davis, QA Manager
TELEPHONE NUMBER: (804) 385-2895

PRINCIPAL PRODUCT: Nuclear steam supply systems and fuels, engineering services, and operating plant support.

NUCLEAR INDUSTRY ACTIVITY: The total effort committed to domestic nuclear activities is approximately 91% of the 1,775 employees of the Nuclear Power Generation Division. Principal activities include the design and procurement of nine projects; Bellefonte, Midland, Washington Public Power Supply System, North Anna, and Pebble Springs; and providing engineering services under 129 service contracts and 38 fuel reload contracts.

ASSIGNED INSPECTOR: D F Fox
D. F. Fox, Reactor Systems Section (RSS) Date 7/2/82

OTHER INSPECTOR(S):

APPROVED BY: C J Hale
C. J. Hale, Chief, RSS Date 7/2/82

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and Topical Report BAW-10096A

B. SCOPE: Design input and design change control as related to nuclear fuel reload design, and status of previous inspection findings.

PLANT SITE APPLICABLITY: Arkansas Nuclear One, 50-313; Haddam Neck Plant, 50-213; Oconee Nuclear Station, 50-269; Rancho Seco Nuclear Generating Station, 50-312.

ORGANIZATION: THE BABCOCK AND WILCOX COMPANY
NUCLEAR POWER GENERATION DIVISION
LYNCHBURG, VIRGINIA

REPORT NO.: 99900400/82-02	INSPECTION RESULTS:	Page 2 of 4

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Nuclear Power Generation Division (NPGD) procedure NPG-0310-42, the Rancho Seco Nuclear Steam Core Project Manager did not originate the fuel cycle design requirements list number 89-1127000-01 for fuel reload cycle 6.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and NPGD procedure NPG-0412-66, the originator of Document Release Notices (DRN) for released and approved documents 86-1123301-00, 86-1123252-00, and 86-1122788-00, did not enter the Product Upgrade List (PUL) status on the DRN's.

3. Contrary to Criterion V of appendix B to 10 CFR Part 50 and NPGD procedure NPG-0310-38, the Historical Document List (HDL) did not serve as an index to safety-related Procurement Authorization (PA) records in the Records Center as evidenced by the fact that PA's 83-768661-00 through 83-768661-09, related to the design and procurement of MK-B5 fuel assemblies and axial blanket fuel assemblies for the SMUD Rancho Seco Cycle 6 fuel reload, were not identified on the HDL.

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and NPGD procedure NPG-0402-01, the first page of calculations 32-1119748-00 and 32-1122317-00, did not have a completely filled out CDS form. The section of the form titled "Summary of Result" did not contain a summary of the results of the calculation.

5. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and NPGD procedures NPG-0402-01 and NPG-0412-66, PUL's were not used to indicate needed changes/additions known at the time or release or to indicate input requirements unavailable at the time of release, for safety-related calculation summary (e.g., 86-1123144-00). These documents were various types of calculation summaries (e.g., 32-1122317-00), which were known at the time to have a PUL relating to the need for verification of source data/references outstanding against it. Further, these design documents were reviewed, released, and transmitted to users without any indication that changes may be required as a result of clearing the PUL's that were outstanding.

6. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and NPGD procedure NPG-0310-38, certain PUL's issued from January 1981 to March 1981, which are NPGD safety-related design documents indicating that review/verification of all source documents for the affected safety-related calculations has not been completed at the time the calculation was approved and released, were:

   a. Not listed on the HDL against the affected calculation;

   b. Not distributed by Release Administration; or

   c. Not associated with the document to be revised and retained in the Records Center.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Unresolved Item (81-020): The recently appointed QA Manager does not appear to possess the minimum qualifications for the position that are delineated in the B&W Topical Report.

   The B&W Topical Report, BAW-10096, was revised (rev. 4) and approved by NRC headquarters. The QA Manager possesses the minimum qualifications delineated in revision 4 of the Topical Report.

2. (Open) Unresolved Item (82-01): Certain structural analyses may not meet regulatory requirements in that they do not appear to be sufficiently detailed with respect to assumptions, bases, source of inputs, reference to the hardware design drawings, analytical model-to-hardware relationship, and interpretation of results.

   Action on this item was deferred to a future inspection.

3. (Open) Unresolved Item (82-01): Procurement controls for flow control valves do not appear to comply with QA program commitments, in that valves were furnished that were not designed to provide the required minimum flow of two gallons per minute in the closed position at a pressure differential of 820 pounds per square inch, and which B&W-NPGD source surveillance and vendor drawing review failed to detect.

   Action on this item was deferred to a future inspection.

ORGANIZATION: THE BABCOCK AND WILCOX COMPANY
NUCLEAR POWER GENERATION DIVISION
LYNCHBURG, VIRGINIA

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E. OTHER FINDINGS OR COMMENTS:

Design Input and Change Control - The B&W Topical Report, the NPGD Quality Assurance Manual for Nuclear Steam System (NSS) and Nuclear Steam Core (NSC) Product Lines, and implementing engineering and administrative procedures were reviewed to determine the commitments and requirements relative to the design and release for manufacture of fuel reloads for the owners of certain B&W and Westinghouse NSS's.

Letters, memoranda, licensing schedules, fuel cycle design requirements, computer codes, calculations and summaries, specifications, drawings, reload reports, procurement authorizations, and changes to related documentation were examined to verify commitments. Six nonconformances were identified in this area of inspection.

With respect to noncomformance B.1, B&W revised and reissued Fuel Cycle Design Requirement 89-112700-01 to include the required signatures, determined that this was an isolated case, and committed to revise procedure NPG-0310-42 to clarify the preparation and signature requirements and to revise the format and content of the form on which the design requirements are listed, by August 1, 1982.

With respect to nonconformance B.2, B&W determined that the lack of identification of PUL status on DRN's appeared to be limited to certain documents generated by one individual during the period January 1981 through March 1981. B&W committed to revise all affected DRN's, and to instruct all analysts of the importance of adhering to procedural requirements, by August 1, 1982.

ORGANIZATION: BAKER INDUSTRIES, INCORPORATED
PYROTRONICS-SENTRACON SYSTEMS
NORWOOD, MASSACHUSETTS

REPORT NO.: 99900770/82-01	INSPECTION DATES: 3/9-10/82	INSPECTION ON-SITE HOURS: 21

CORRESPONDENCE ADDRESS: Baker Industries, Incorporated
Pyrotronics-Sentracon Systems
ATTN: Mr. W. L. Bliss
General Manager
51 Morgan Drive
Norwood, Massachusetts 02062

ORGANIZATION CONTACT: Mr. W. L. Bliss, General Manager
TELEPHONE NUMBER: (617) 769-4600

PRINCIPAL PRODUCT: Physical Protection Systems and Devices

NUCLEAR INDUSTRY ACTIVITY: Did not obtain during this inspection.

ASSIGNED INSPECTOR: W. E. Foster
W. E. Foster, Reactive & Components Program Sec. (R&CPS) 3/31/82 Date

OTHER INSPECTOR: J. A. F. Kelly, Chief, Physical Security Section

APPROVED BY: for I. Barnes
I. Barnes, Chief, R&CPS 3/31/82 Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21; and Appendix B of 10 CFR Part 50.

B. SCOPE: This inspection was made as a result of the issuance of a 10 CFR Part 21 report pertaining to a problem with Model 170 card readers. An additional area of inspection was initial quality assurance program. Also, an initial management meeting was conducted.

PLANT SITE APPLICABILITY: Dockets: 50-280/281; 50-338/339; 50-250/251; 50-3, 50-247, 50-286; 50-335, 50-389; 50-443/444; and 50-261.

ORGANIZATION: BAKER INDUSTRIES, INCORPORATED
PYROTRONICS-SENTRACON SYSTEMS
NORWOOD, MASSACHUSETTS

REPORT NO.: 99900770/82-01	INSPECTION RESULTS:	PAGE: 2 of 3

A. VIOLATIONS:

1. Contrary to paragraph 21.21(a) of 10 CFR Part 21, procedures had not been adopted for (1) evaluating deviations or informing the licensee or purchaser of the deviation, and (2) assuring that a director or responsible officer is informed if the supplied basic component (a) fails to comply or (b) contains a defect.

2. Contrary to paragraph 21.21(b)(3), and its subparagraph (vi) of 10 CFR Part 21, the written report did not contain the number and location of all basic components which contained a defect. For example, an identical model was purchased by Honeywell for use at the H. B. Robinson Nuclear Power Generating Station, but this information was not included in the report; nor was the information that Signatron purchased components for use at Nuclear Power Generating Stations. Honeywell and Signatron apply their respective labels to the equipment. Furthermore, Lake Systems Corporation is purchasing equipment for use at the Seabrook Nuclear Power Generating Station. Honeywell, Lake Systems nor Signatron had been apprised of the problem.

   Subsequent to completion of the inspection, copies of two letters have been received. They are dated March 10, 1982, and addressed to Honeywell Incorporated at Arlington Heights, Illinois, and Signatron at Timonium, Maryland, respectively.

   Based on the foregoing, the written response need not address corrective action; however, it must address preventive measures.

3. Contrary to paragraph 21.51(b) of 10 CFR Part 21, records of evaluation (pre- and post-testing of problem identification and correction, other potential problems in the same area, etc.) had not been prepared to provide assurance that modification of the card reader and/or wiring harness eliminated the problem.

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Follow up on a 10 CFR Part 21 Report: The report, drawings, photographs, letters to purchasers and other letters to the Commission are stamped in accordance with 10 CFR 2.790 and will be protected under Section 147 of the Atomic Energy Act and 10 CFR 73.21. As a result, a

ORGANIZATION: BAKER INDUSTRIES, INCORPORATED
PYROTRONICS-SENTRACON SYSTEMS
NORWOOD, MASSACHUSETTS

REPORT NO.: 99900770/82-01	INSPECTION RESULTS:	PAGE: 3 of 3

description of the problem is withheld. The problem was corrected in the field by modifying the card reader and/or the wiring harness. Model 170 card readers that have been manufactured since August 26, 1981, incorporate a modification to preclude recurrence. An Engineering Change Order and appropriate drawings reflect the modification; however, there were no documents to indicate that the modification corrected the problem. As a result, it was not apparent that corrective and preventive measures were adequate.

2. Initial Quality Assurance Program Inspection: There was an undated, unsigned document entitled, "Quality Assurance Plan, No. 1," which contained the statement, ". . . as of the date of its issuance shall apply . . . ."

It can be concluded that it had not been issued, inasmuch as it had not been dated. The reviewed purchase orders did not invoke quality requirements.

ORGANIZATION: BECHTEL POWER CORPORATION
ANN ARBOR POWER DIVISION
ANN ARBOR, MICHIGAN

REPORT NO.: 99900501/82-01	INSPECTION DATE(S) 5/3-6/82	INSPECTION ON-SITE HOURS: 28

CORRESPONDENCE ADDRESS: Bechtel Power Corporation
Ann Arbor Power Division
ATTN: Mr. W. H. Wahl, V. Pres. and Gen. Mgr.
777 East Eisenhower Parkway
Ann Arbor, Michigan 48106

ORGANIZATIONAL CONTACT: Mr. W. D. Greenwell
TELEPHONE NUMBER: (313) 994-7223

PRINCIPAL PRODUCT: Architect Engineering Services

NUCLEAR INDUSTRY ACTIVITY: The total effort committed to domestic nuclear activities is approximately 77% of the 2050 person staff at the Ann Arbor Power Divisio... The division currently provides the principal architect engineering services for two domestic units, Midland 1 and 2, and has modification/repair/service contracts on 10 additional reactor units.

ASSIGNED INSPECTOR: C J Hale for — 6/11/82
J. R. Costello, Reactor Systems Section (RSS) — Date

OTHER INSPECTOR(S):

APPROVED BY: C J Hale — 6/11/82
C. J. Hale, Chief, RSS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and Topical Report No. BQ-TOP-1.

B. SCOPE: This inspection was conducted to assess the effectiveness of Bechtel's QA program in the area of design verification.

PLANT SITE APPLICABILITY:

The contents of this report relate to the following dockets: 50-329 and 50-330.

ORGANIZATION: BECHTEL POWER CORPORATION
ANN ARBOR POWER DIVISION
ANN ARBOR, MICHIGAN

REPORT NO.: 99900501/82-01	INSPECTION RESULTS:	PAGE 2 of 2

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

Design Verification- Topical Report BQ-TOP-1, applicable Engineering Department Procedures with their associated Manager of Engineering Directives and Engineering Department Project Instructions were examined to determine quality assurance program commitments. To verify implementation of these commitments, the following documents were examined: 10 design control check lists, 3 material requisitions, 1 project "Q" list, 1 mechanical equipment list, 4 calculations, 16 design review notices, and 4 design requirement verification checklists. Relative to the documents examined, no violations, nonconformances, or unresolved items were identified. However, it was observed that the procedural requirements of section 3.1 MED 4.34.0 regarding the proper sequencing of approval signatures was not always being followed. This item will be further inspected during subsequent inspections.

ORGANIZATION: BECHTEL POWER CORPORATION
ANN ARBOR POWER DIVISION
ANN ARBOR, MICHIGAN

REPORT NO.: 99900501/82-02	INSPECTION DATE(S) 7/27-30/82	INSPECTION ON-SITE HOURS: 54

CORRESPONDENCE ADDRESS: Bechtel Power Corporation
Ann Arbor Power Division
ATTN: Mr. W. H. Wahl, Vice Pres. and Gen. Mgr.
P. O. Box 1000
Ann Arbor, Michigan 48106

ORGANIZATIONAL CONTACT: Mr. W. D. Greenwell
TELEPHONE NUMBER: (313) 994-7223

PRINCIPAL PRODUCT: Architect Engineering Services

NUCLEAR INDUSTRY ACTIVITY: The total effort committed to domestic nuclear activities is approximately 77% of the 2200 person staff at the Ann Arbor Power Division. The division currently provides the principal architect engineering services for two domestic units, Midland 1 and 2, and has modification/repair/service contracts on 10 additional reactor units.

ASSIGNED INSPECTOR: J. R. Costello
J. R. Costello, Reactor Systems Section (RSS) Date 8/25/82

OTHER INSPECTOR(S): P. H. Harrell, RSS

APPROVED BY: C. J. Hale
C. J. Hale, Chief, RSS Date 8/25/82

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and Topical Report No. BQ-TOP-1.

B. SCOPE: This inspection was conducted to assess the effectiveness of Bechtel's QA program in the area of design process management, audits, and followup in the design control area.

PLANT SITE APPLICABILITY:

The contents of this report relate to the following dockets: 50-329 and 50-330.

ORGANIZATION: BECHTEL POWER CORPORATION
ANN ARBOR POWER DIVISION
ANN ARBOR, MICHIGAN

REPORT NO.: 99900501/82-02	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATIONS:

None

B. NONCONFORMANCES:

Contrary to the requirements of Bechtel Procedure EDPI-4.49.1, Specification Change Notices are not being incorporated into the applicable Technical Specifications within the required time period.

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Design Control Follow Up - During the previous inspection, the inspector noted that the requirements of MED 4.34-0, regarding the proper sequencing of approval signatures for the Design Control Checklist (DCCL), did not appear to be properly understood and were not always being followed.

   MED 4.34-0 has been revised to read as follows: "Upon approval of the DRN and DCCL by the discipline chief engineer and approval of the DRN by the chief nuclear engineer, the documents are returned to the cognizant discipline. Upon return of the approved DCCL, the project engineer shall approve and issue the DCCL for use." Also, the project engineer has been instructed not to approve the DCCL until the proper approval have been obtained.

2. Design Process Management - Topical Report BQ-TOP-1 and applicable Bechtel procedures were examined to determine quality assurance program commitments. Within the scope of this inspection, the following specific areas were examined: preparation, review, and approval of procedures implementing QA commitments; development, review, and approval of a DCCL and the associated Design Review Notices (DRN); design calculations used to support data sheets in Technical Specifications; and preparation, review, and approval of Technical Specifications and the associated SCN's. To verify implementation and practice of these commitments, the following documents were examined: 1 Q-list, 7 Technical Specifications, 16 SCN's, 18 EDPI's, 51 MED's, 21 DRN's, 1 DCCL, 5 EDP's, 2 data sheets, and 4 calculations. Based on the documents examined, a nonconformance was identified (see B. above).

ORGANIZATION: BECHTEL POWER CORPORATION
ANN ARBOR POWER DIVISION
ANN ARBOR, MICHIGAN

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3. Audits - Topical Report BQ-TOP-1 and applicable Bechtel procedures were examined to determine quality asasurance program commitments. To verify implementation of these commitments, the following documents were examined: five QA management audits, two QA master audit plans, three quarterly QA program status and adequacy reports, one QA management audit schedule of technical specialists participation, one schedule of QA management audits, one quality audit checklist, and one project audit report of Palisades project engineering. Relative to the documents examined, no nonconformances or unresolved items were identified, but the following items were identified for followup in a future inspection.

   a. Section 5.5 of QA Management Audit Procedures, (QA Department Manual, Section B, Number 5) states in part, "Management audits of each type listed in paragraph 2.0 shall be conducted at least annually. Schedules shall be developed for a one year period with quarterly publication to identify as a minimum the audits of the next three months."

      A review of the audit schedules showed that the schedule for the one year period had been developed, but that the updating was not always issued as a quarterly publication. This matter will be reinspected during the next regular inspection.

   b. Section 6.1.f of the QA Management Audit Procedure states in part, "The audit team leader is responsible at all times for the checklists used to fulfill his audit plan. His approval shall appear twice on the face of the list: once to indicate approval of the checklists prior to use and again to indicate readiness of the checklist for filing after the audit. They may be shown in any clear manner."

      A review of the checklists for six audits revealed difficulty in identifying required approvals and inconsistencies in following this requirement; e.g., auditor approval in place of lead auditor approval. This matter will be reinspected during the next regular inspection.

   c. Section 9.0.e of QA Management Audit Procedure states in part, "The QA Management Audit group will maintain a simple follow up system to make visible to the QA Supervisor - Audits the status of action closeouts. A summary of status will be included in quarterly activity reporting."

ORGANIZATION: BECHTEL POWER CORPORATION
ANN ARBOR POWER DIVISION
ANN ARBOR, MICHIGAN

REPORT NO.: 99900501/82-02	INSPECTION RESULTS:	PAGE 4 of 4

The inspector noted that many quality audit findings resulting from the six audits reviewed had not met the scheduled completion date and some were still open. Also, the inspector could not find any evidence that a summary of status was included in any quarterly activity reporting. A review of three Quarterly QA Program Status and Adequacy Reports, which could be used for quarterly activity reporting of the status of action closeouts, showed management audit findings but no status of action closeouts. This matter will be reinspected during the next regular inspection.

ORGANIZATION: BECHTEL POWER CORPORATION
GAITHERSBURG POWER DIVISION
GAITHERSBURG, MARYLAND

REPORT NO.: 99900519/82-02	INSPECTION DATE(S) 5/17-21/82	INSPECTION ON-SITE HOURS: 32

CORRESPONDENCE ADDRESS: Bechtel Power Corporation
Gaithersburg Power Division
ATTN: Mr. J. M. Komes, Vice Pres. & Gen. Mgr.
15740 Shady Grove Road
Gaithersburg, MD 20760

ORGANIZATIONAL CONTACT: Mr. D. C. Kansal, QA Manager
TELEPHONE NUMBER: (301) 258-3776

PRINCIPAL PRODUCT: Architect Engineering Services

NUCLEAR INDUSTRY ACTIVITY: The Gaithersburg Power Division has a total of 2857 employees of which 1945, or 68%, are assigned to nuclear projects. Major projects include Callaway, Unit 1; Wolf Creek, Unit 1; and Grand Gulf, Units 1 and 2. There are also modification/repair/service contracts on 16 additional reactor units.

ASSIGNED INSPECTOR: J. R. Costello — 6/28/82
J. R. Costello, Reactor Systems Section (RSS) — Date

OTHER INSPECTOR(S):

APPROVED BY: C. J. Hale — 6/29/82
C. J. Hale, Chief, RSS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B; SNUPPS PSAR, Chapter 17; and Grand Gulf PSAR, Chapter 17.

B. SCOPE: This inspection was conducted to assess the effectiveness of Bechtel's QA program in the areas of design document control and design interfaces.

PLANT SITE APPLICABILITY:

The contents of this report relate to the following dockets: 50-416, 50-417, 50-482, and 50-483.

ORGANIZATION: BECHTEL POWER CORPORATION
GAITHERSBURG POWER DIVISION
GAITHERSBURG, MARYLAND

REPORT NO.: 99900519/82-02	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to the requirements of Criterion V of 10 CFR Part 50, Appendix B and EDP-7.5, several individual signature identification cards were not completed in accordance with procedures.

2. Contrary to the requirements of Criterion V of 10 CFR Part 50, Appendix B EDPI-4.46-01, EDPI-4.47-01, and PEPM 4.3.1.6, outstanding DCN's are not being incorporated into drawings within the required time frame.

3. Contrary to the requirements of Criterion V of 10 CFR Part 50, Appendix B and QGG-2.1, some Grand Gulf specifications did not identify the applicable dates, revisions, or addenda of technical codes and standards.

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

Design Interfaces/Design Document Control - Applicable PSAR commitments, quality assurance procedures and project procedures were examined to determine quality program commitments. To verify implementation of these commitments, the following documents were examined: 1 document release log; 1 mechanical equipment list; 31 drawings; 20 specifications; 4 system descriptions; 75 individual signature cards; 2 design criteria; 1 project summary "Q" list; and 1 mechanical design control checklist (DCCL). Relative to the documents examined, three nonconformances were identified (see B. above), and the following items were noted for followup in future inspections.

1. A review of Grand Gulf specifications showed that DCN's 7, 8, and 9 had not been incorporated into specification C-103.1 within 90 days as required by PEPM 4.5.1.6.2. This appears to be an isolated case, but requires further review.

2. Section 4.2 of EPP-1.10 has a requirement which states, "In cases where an EDPI exhibit is modified, but the basic EDPI remains unchanged, the revised exhibit may be issued separately. In such cases, the revision date is added as the fourth line in the identification block." In reviewing EDPI 5.25-01, Revision 2, where the

ORGANIZATION: BECHTEL POWER CORPORATION
GAITHERSBURG POWER DIVISION
GAITHERSBURG, MARYLAND

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exhibits were revised, it was noted that the revision date was added, but was not added as the fourth line in the identification block. This requirement needs to be reviewed and possibly revised.

3. Section 4.0 of EDPI 5.21-01 states in part, "Revisions to the Project Master Distribution Schedule shall be as defined in Section 3.0." The inspector was unable to identify in Section 3.0 how revisions to the Project Master Distribution Schedule would be made.

4. Section 6.0 of EDPI-4.49-01 (SNUPPS) states, "A coordination signature block (Exhibit A, sheet 2) shall be provided for each Bechtel specification for required discipline Group Supervisor/Group Leader or an assigned subordinate's initials." A review of SNUPPS specifications disclosed that the coordination signature blocks were missing on specifications J-601(9), M-140(9), and M-00B(Q). This is a project unique requirement and needs further review.

ORGANIZATION: BECHTEL POWER CORPORATION
LOS ANGELES POWER DIVISION
NORWALK, CALIFORNIA

REPORT NO.: 99900521/82-02	INSPECTION DATE(S) 6/7-11/82	INSPECTION ON-SITE HOURS: 31

CORRESPONDENCE ADDRESS: Bechtel Power Corporation
Los Angeles Power Division
ATTN: Mr. J. V. Morowski
Vice President and General Manager
P. O. Box 60680, Terminal Annex
Los Angeles, CA 90060
ORGANIZATIONAL CONTACT: Mr. R. L. Patterson, QA Manager
TELEPHONE NUMBER: (213) 864-6011, Ext. 2061

PRINCIPAL PRODUCT: Architect Engineering Services

NUCLEAR INDUSTRY ACTIVITY: The Los Angeles Power Division of the Bechtel Power Corporation is the architect engineer for nine domestic reactor units. Fifty percent of the total personnel (approximately 7,700) are assigned to activities in connection with these units and two modification/repair/service type contracts.

ASSIGNED INSPECTOR: J. R. Costello — 7/9/82
J. R. Costello, Reactor Systems Section (RSS) — Date

OTHER INSPECTOR(S):

APPROVED BY: C. J. Hale — 7/15/82
C. J. Hale, Chief, RSS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and PVNGS PSAR, Chapter 17.

B. SCOPE: This inspection was conducted to assess the effectiveness of Bechtel's QA program in the area of design corrective action, design verification follow-ups, and the status of previous inspection findings.

PLANT SITE APPLICABLITY: The contents of this report relate to the following dockets: 50-361, 50-362, 50-424, 50-425, 50-528, 50-529, and 50-530.

ORGANIZATION: BECHTEL POWER CORPORATION
LOS ANGELES POWER DIVISION
NORWALK, CALIFORNIA

REPORT NO.: 99900521/82-02	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATIONS:

None

B. NONCONFORMANCES:

Contrary to the requirements of Criterion V of 10 CFR Part 50, Appendix B and Engineering Department Procedure EDP-4.66, five out of six Deficiency Evaluation Reports (DER's) examined, did not comply with the procedural requirement that the initiator sign and date the DER's.

C. UNRESOLVED ITEMS:

Procedure IP-2.12 (Audit Followup) has a requirement which states, "If the response to an audit report or corrective action request cannot be made by the requested due date, the Project Quality Engineer (PQE) or responsible Group Supervisor (GS) shall prepare a handwritten memo requesting an extension of time. The memo shall state the reason why the audit report cannot be answered by the requested due date and shall be countersigned by the Project Engineer (PE)." The inspector reviewed six Corrective Action Reports (CAR's), two of which requested an extension of time, but were not signed by the PE. CAR, PVH 81-285, pertained to an ASME design specification without a required PE seal and the other CAR, PVH 82-075, pertained to nonconforming items shipped without prior approved Supplier Deviation Disposition Requests (SDDR's). The inspector could not determine whether the extension of time for these two CAR's should have been signed by the PE, or whether they were special cases not requiring the PE signature. This matter will be inspected further during the next inspection.

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Unresolved Item (81-02): It is not apparent that the requirement for independent verification of engineering specifications is being properly implemented. Procedure IP-4.6, "Project Material Requisitions and Specifications" requires an independent verification by an engineer who has a level of design capability sufficient to have originated the specification. Present documentation of design specification reviews does not clearly identify the independent reviewer.

   IP-4.6 was revised on January 13, 1982. The revised procedure now requires the independent design reviewer's signature on the Document Review Notice for specifications.

2. (Open) Nonconformance (82-01): No managers or their designees attended the pre- and postaudit conferences for the management audit of Songs 2 and 3 engineering office. Also, no department/

project/construction manager or their designees attended the preaudit conference for the management audit of the Vogtle design office.

This item remains open because a response was not due at this time.

3. (Open) Nonconformance (82-01): The response to CAR-002 from the management audit of the Vogtle design office was 11 days beyond the 30-day requirement and no scheduled date for response had been established and the management audit of division engineering had scheduled corrective action for CAR-001 by March 20, 1981; however, this item was still open about a year later.

   This item remains open because a response was not due at this time.

4. (Open) Nonconformance (82-01): The Vogtle Audit Activity Report for January and February 1982, did not identify the personnel contacted during the preaudit, audit, and postaudit activities.

   This item remains open because a response was not due at this time.

5. (Closed) Unresolved Item (82-01): It was not apparent that there was an effective means of revision control for the Quality Assurance Training Manual (which is a controlled document). The inspector could not be certain the procedures in the manual were the latest procedures since the Table of Contents did not reference revisions.

   The Table of Contents has been revised and now shows the revision numbers of the procedures.

6. (Open) Unresolved Item (82-01): It is not apparent that the present method of verifying indoctrination and training of Quality Assurance Engineers and project personnel is adequate. The practice of using signatures, initials, and dates in the training does not provide a measure of comprehension of the subject matter. Comprehension for NDE personnel, for example, is provided by written examination and is documented.

   This item pertains to Bechtel/Houston and will be inspected during the next regular inspection at Houston.

E. OTHER FINDINGS OR COMMENTS

1. Design Corrective Action - Applicable engineering department procedures,

ORGANIZATION: BECHTEL POWER CORPORATION
LOS ANGELES POWER DIVISION
NORWALK, CALIFORNIA

REPORT NO.: 99900521/82-02	INSPECTION RESULTS:	PAGE 4 OF 4

division instructions, Palo Verde quality program procedures, quality assurance department procedures, and Palo Verde project procedures were examined to determine quality assurance program commitments. To verify implementation of these commitments, the following documents were examined: five corrective action reports (CAR), one CAR status report, five document review notices, one material requisition, one deficiency evaluation report log, one DER status summary, six deficiency evaluation reports and one QA bulletin. Relative to the documents examined, the non-conformance in B was identified and the following concern was identified for followup during the next regular inspection.

Palo Verde internal procedure, IP-4.14, requires that specification change notices (SCN) be incorporated into a specification when 10 or more SCN's are outstanding. This has been identified by Bechtel on CAR PVH 7/82-11A, but the practice of allowing more than 10 SCN's to accumulate before incorporation is still being practiced. Revision 6 to specification 13-MM-598, dated May 7, 1980, incorporated 25 SCN's, and revision 7 to the same specification dated January 23, 1981, incorporated 37 SCN's.

2. Design Verification Followup - As a result of NRC QAB Interpretation No. 8, dated July 26, 1977, a signature or initial of the reviewer with the date on the design document is adequate evidence that a satisfactory design review has been performed. QAB Interpretation No. 8 also requires that records be maintained such that signatures or initials can be traced to individuals. Within the Bechtel Power Corporation, the practice of maintaining signature and initial identification varies widely. An inspection of the signature and initial identification at LAPD disclosed that neither the Vogtle nor San Onofre projects had procedures governing this subject while Palo Verde did. The Palo Verde project procedure, IP-2.8, requires the project administrator to review the project signature list at least every two months, but this requirement is not auditable. On the Vogtle project, 10 names were identified where either the signature or inital: were missing and on the Palo Verde project six names were identified without signature or initials. On the San Onofre project the signature and initial identifications were maintained by the Project Quality Engineer and all signatures and initials were identifiable. Also, on the San Onofre project the initials had to be written, not printed. The inspector's concern over LAPD signature and initial identification will be reviewed again during the next regular inspection.

ORGANIZATION: BECHTEL POWER CORPORATION
LOS ANGELES POWER DIVISION
NORWALK, CALIFORNIA

REPORT NO: 99900521/82-03	INSPECTION DATE(S) 6/21-25/82	INSPECTION ON-SITE HOURS: 32

CORRESPONDENCE ADDRESS: Bechtel Power Corporation
Los Angeles Power Division
ATTN: J. V. Morowski, Vice President and General Manager
P. O. Box 60680, Terminal Annex
Los Angeles, CA 90060

ORGANIZATIONAL CONTACT: R. L. Patterson, QA Manager
TELEPHONE NUMBER: (213) 864-6011, ext. 2061

PRINCIPAL PRODUCT: Architect Engineering Services

NUCLEAR INDUSTRY ACTIVITY: The Los Angeles Power Division, Houston Area Office, is responsible for the design, procurement, and construction management of the South Texas Project, Units 1 and 2. At the present time, the Houston Area Office has a staff of 773 working on the South Texas Project.

ASSIGNED INSPECTOR: C J Hale/for 7/29/82
J. R. Costello, Reactor Systems Section (RSS) Date

OTHER INSPECTOR(S):

APPROVED BY: C J Hale 7/29/82
C. J. Hale, Chief, RSS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B, and Topical Report No. BQ-TOP-1.

B. SCOPE: This inspection was conducted to assess the effectiveness of Bechtel's QA program in the area of audits and to check on the status of previous inspection findings.

PLANT SITE APPLICABILITY:

The contents of this report relate to Docket 50-498 and 50-499.

ORGANIZATION: BECHTEL POWER CORPORATION
LOS ANGELES POWER DIVISION
NORWALK, CALIFORNIA

REPORT NO: 99900521/82-03	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to the requirements of Criterion V of 10 CFR Part 50, Appendix B, and Section 18, Project Quality Program Manual, the Monthly Audit Activity Report was not distributed to Division QA or Project Management.

   No written response is required for this nonconformance as corrective and preventive actions were taken prior to the close of the inspection.

2. Contrary to the requirements of Criterion V of 10 CFR Part 50, Appendix B, and Quality Assurance Department Procedure QADP-5.1, the Quality Element Checklist was not signed and dated by the Lead auditor.

   No written response is required for this nonconformance as corrective and preventive actions were taken prior to the close of the inspection.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

(Closed) Unresolved Item (82-01): It is not apparent that the present method of verifying indoctrination and training of Quality Assurance Engineers and project personnel is adequate. The practice of using signatures, initials, and dates in the training records to show completion of indoctrination and training does not provide a measure of comprehension of the subject matter.

Bechtel policy does not require written examinations to verify comprehension of indoctrination and training subject matter unless such examinations are required by Codes, Standards, or Regulations.

Proficiency of individuals performing quality-related work is verified by management review of work performed, formal inspections, project QA audit and surveillance, QA management audits, and supervisory interviews.

ORGANIZATION: BECHTEL POWER CORPORATION
LOS ANGELES POWER DIVISION
NORWALK, CALIFORNIA

REPORT NO: 99900521/82-03	INSPECTION RESULTS:	PAGE 3 of 4

The South Texas Project plans to use group leaders to monitor and audit training comprehension and will establish a Quality Engineering Monitoring plan similar to EDPI-2.13.1 (used at Ann Arbor) to monitor instruction and training. Also, this area will be audited by QA.

E. OTHER FINDINGS OR COMMENTS:

Audits - Applicable PSAR commitments, quality assurance procedures, and project procedures were examined to determine quality program commitments. To verify implementation of these commitments, the following documents were examined: one audit activity report, a quality audit schedule, a quality assurance master audit plan, three quality element checklists, three audit activity reports, a corrective action request log, three corrective action requests, six training records and a South Texas Project signature list. Relative to the documents examined, two nonconformances were identified (see B. above). Corrective and preventive actions were taken regarding these nonconformances prior to the close of the inspection. These actions were as follows:

- Nonconformance B.1 - The May Audit Activity Report was redistributed to the proper distribution on June 23, 1982. This was the first monthly Audit Activity Report issued and it was issued to the Site Project Quality Assurance Engineer. Project Quality Assurance was made aware of the proper procedural distribution of this report.

- Nonconformance B.2 - Audits 1.1, 2.1, and 5.1 were the first three project quality assurance audits conducted on the South Texas Project. The Lead auditor responsible for the audits signed and dated the first three Quality Element Checklists prior to the close of the inspection. Both project Quality Assurance Lead Auditors and the Project QA manager were made aware of this procedural requirement.

The following items of concern were identified for followup in a future inspection:

1. Paragraph 3.5 of Section 18, "Project Quality Program Manual" states, "The Project Quality Assurance Manager is responsible for submitting a monthly summary of Quality Assurance activities which includes the results of audits to the Quality Assurance Manager of the Los Angeles Power Division." However, paragraph 10.1 of QADP 3.6 states, "During the time period project activities are in the design phase and confined to the design office, distribution of the Quality Assurance Monthly Activity Report shall include the Quality Assurance Manager/Projects, Project Manager and Project Engineer.

ORGANIZATION: BECHTEL POWER CORPORATION
LOS ANGELES POWER DIVISION
NORWALK, CALIFORNIA

REPORT NO: 99900521/82-03	INSPECTION RESULTS:	PAGE 4 of 4

The last Quality Assurance Monthly Activity Report was sent to the Quality Assurance Manager/Projects while the six previous reports were sent to the Quality Assurance Manager of the Los Angeles Power Division.

This conflict in procedures will be considered further during subsequent inspections.

2. On the South Texas Project Signature List, some of the signatures or initials or both were missing. Also, STP General Project Requirements procedure 2.11, "Document Signature and Initial Identification" has a requirement that Project Administration will review the Project Signature List at least every two months. This requirement is not auditable with the present format of the signature list. In discussing this matter with the Project Administration Manager, it was disclosed that they are planning to change the present system to a more efficient system utilizing signature cards. This problem will be reviewed during the next inspection.

3. In reviewing Audits 1.1, 2.1, and 5.1 it was noted that there was a requirement that persons contacted during an audit were to be listed on the Quality Element Checklist and were also to be listed on the Audit Activity Report. A review of these documents showed that not all names were listed on both lists. The names are as follows:

Audit No.	Listed on Quality Element Checklist, but not on Audit Activity Report	Listed on Audit Activity Report, but not on Quality Element Checklist
1.1	C. Speck	D. Hauglum
2.1	R. L. Rogers T. C. Smith	M. Lawson G. Lopez P. Kakkad J. LeBlanc R. Ramsey
5.1		G. McConnell

This problem will be reviewed further during the next inspection.

ORGANIZATION: BERGEN PATERSON PIPESUPPORT CORPORATION
PITTSBURGH, PENNSYLVANIA

REPORT NO.: 99900777/82-01	INSPECTION DATE(S) 4/12-15/1982	INSPECTION ON-SITE HOURS: 24

CORRESPONDENCE ADDRESS: Bergen Paterson Pipesupport Corporation
ATTN: Mr. E. E. Nilson, Branch Manager
2247 Babcock Road
Pittsburgh, Pennsylvania 15237

ORGANIZATIONAL CONTACT: R. H. Stephens, Manager of Quality Assurance
TELEPHONE NUMBER: (603) 524-1990

PRINCIPAL PRODUCT: Pipesupports.

NUCLEAR INDUSTRY ACTIVITY: Bergen Paterson Pipesupport Corporation's Pittsburgh, Pennsylvania, Branch Office contribution to the nuclear industry represents approximately 85 percent of its total work load.

ASSIGNED INSPECTOR: J. Barnes for Wm. D. Kelley, Reactive & Component Program Section (R&CPS) — 7-23-82 Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes, Chief, R&CPS — 7-23-82 Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21 and 10 CFR Part 50, Appendix B

B. SCOPE: This inspection was made as a result of the issuance of a 10 CFR Part 50.55(e) report by Louisiana Power and Light Company concerning the discovery that the stress analysis had not been performed prior to the fabrication of pipesupports that had been furnished to Waterford Generating
(cont. on next page)

PLANT SITE APPLICABILITY: 50-382

ORGANIZATION: BERGEN PATERSON PIPESUPPORT CORPORATION
PITTSBURGH, PENNSYLVANIA

REPORT NO.: 99900777/82-01	INSPECTION RESULTS:	PAGE 2 of 4

SCOPE: (Cont.) Station, Unit 3. Additional areas selected for inspection included design and document control.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Construction Deficiency Report by Louisiana Power and Light Company (LP&L) - Problem reported was the discovery that stress analysis had not been performed prior to the fabrication of pipesupports that were furnished to the Waterford Generating Station, Unit 3.

   a. Background

      In an August 10, 1981, letter LP&L notified Region IV by providing copies of an Interim Report of Significant Construction Deficiency No. 32, "Stress Analysis for Welded Pipe Support Attachments Was Not Performed Prior to Fabrication," in accordance with paragraph 50.55(e) of 10 CFR Part 50. In an August 11, 1981, meeting, which was attended by Ebasco Service, Inc., Dravo Corp., and Bergen Paterson Pipesupport Corp. (BPPC) personnel, the following status of the 718 pipesupport analyses was provided:

      (1) 55 pipesupports had been identified as failing analysis;

      (2) 120 pipe support analyses were on hold at Bergen Paterson Technical Support, Inc., (BPTS) awaiting mean nominal stress from Ebasco;

      (3) 29 pipesupports were on hold at BPPC; and

      (4) 514 pipesupports were awaiting completion of the stress analysis.

ORGANIZATION: BERGEN PATERSON PIPESUPPORT CORPORATION
PITTSBURGH, PENNSYLVANIA

REPORT NO.: 99900777/82-01	INSPECTION RESULTS:	PAGE 3 of 4

b. Findings

The pipe supports for the Waterford Generating Station, Unit 3, were purchased from BPPC by Dravo on their Purchase Order Number E2804-1, dated October 5, 1973, which specified the Ebasco Specification Number LOU-1564.100 as the applicable design specification.

The Dravo purchase order did not address applicability of 10 CFR Part 50, Appendix B to the contract, but the Ebasco design specification did include Ebasco Specification 860-72 which states in part, ". . . In addition for all safety related equipment, materials and services, the Vendor's Quality Control Program shall comply with the requirements of Title 10, Part 50, Appendix B . . . ." BPPC did have a Quality Assurance and Control Manual that was applied to the Dravo purchase order, but the manual did not provide for: (1) measures for the identification and control of design interfaces and coordination among participating design organizations; (2) measures that assured required documents were distributed and used at the location where the prescribed activity was performed; (3) source evaluation and selection; and (4) a comprehensive system of planned and periodic audits.

Since subsection NF of Section III of the ASME Code was not in effect at the time of the Dravo contract, ASME Code requirements for design and stress analysis of welded attachments to piping systems were not addressed. BPPC, in conjunction with Ebasco selected Welding Research Council Bulletin 107 "Local Stresses in Spherical and Cylindrical Shells Due to External Loading" and Bulletin 198 "Secondary Stress Indices at Lug Supports on Piping Systems" to be used for designing the welded pipe attachments.

Since the contract documents did not define who had the specific responsibility for the stress analysis of the welded pipe attachments, there has been disagreement between Ebasco and BPPC as to who has this responsibility. BPPC's position has been that since the design of the piping system is performed by others and the welding of the piping attachments was performed by Dravo and Ebasco's mechanical contractor, it was Ebasco's responsibility to perform the stress analysis.

The inspection established that detail pipesupport drawings had been submitted to Ebasco for review and then released, with Ebasco's concurrence, for fabrication of the pipesupports concurrently and prior to completion of all required stress analysis at BPTS, Cambridge, Massachusetts.

The NRC inspector reviewed the documentation of the 55 pipesupports and verified that none were installed in Ebasco Category I safety systems; 38 were installed in Categories 2 and 3 safety systems.

There was no documentary evidence that from the placement of the contract (October 5, 1973) to the time of this inspection, that Dravo had performed a vendor audit of the BPPC Pittsburgh branch office to verify compliance with Appendix B to 10 CFR Part 50.

c. 10 CFR Part 21

Ebasco notified BPPC by letter dated October 18, 1977, that 10 CFR Part 21 became effective for all safety-related items supplied to the Waterford Generating Station, Unit 3, on August 10, 1977. The NRC inspector verified that BPPC had posted the appropriate documents to meet the requirements of 10 CFR Part 21.

d. Followup Item

The resolution of the disagreement between Ebasco and BPPC concerning responsibility for performing and approving the stress analyses of the welded attachments will be reviewed on a subsequent inspection.

2. Design and Document Control - The ASME accepted BPPS Corporate QA Manual and four engineering procedures were reviewed. The BPPC Pittsburgh Branch Office does not have and has not had a contract in house for pipesupport systems that specifies Subsection NF to Section III of the ASME Code.

ORGANIZATION: BORG-WARNER
NUCLEAR VALVE DIVISION
VAN NUYS, CALIFORNIA

REPORT NO.: 99900289/32-02	INSPECTION DATES: 4/15-16/82	INSPECTION ON-SITE HOURS: 16

CORRESPONDENCE ADDRESS: Borg-Warner
Nuclear Valve Division
ATTN: Mr. R. J. Rutkowski
Manager, Remote and Manual Operators
7500 Tyrone Ave.
Van Nuys, CA 91409

ORGANIZATIONAL CONTACT: Mr. R. J. Rutkowski, Manager, Remote and Manual Operators
TELEPHONE NUMBER: (213) 781-4000

PRINCIPAL PRODUCT: Nuclear Control Valves

NUCLEAR INDUSTRY ACTIVITY: The total effort committed to Domestic Nuclear Activities at the Van Nuys, California facility is approximately 70% of plant production.

ASSIGNED INSPECTOR: J. R. Agee — 7/21/82
J. R. Agee, Equipment Qualification Section (EQS) — Date

OTHER INSPECTOR: A. L. Smith, EQS

APPROVED BY: H. S. Phillips — 7-21-82
H. S. Phillips, Chief, EQS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B, IEEE 323-1974, and NUREG 0588, Rev. 1.

B. SCOPE: This inspection was made to verify that the scheduled qualification testing of the Borg-Warner (B-W) valve actuator is proceeding in compliance with a test plan and procedure that meets the criteria of IEEE Standard 323-1974 and NUREG-0588, Rev. 1; and that the qualification testing is proposed to be conducted in a test facility capable of providing simulated loss of coolant accident (LOCA) test conditions.

PLANT SITE APPLICABILITY: The valve actuator is currently being qualification tested for specific use in 50-382.

ORGANIZATION: BORG-WARNER
NUCLEAR VALVE DIVISION
VAN NUYS, CALIFORNIA

REPORT NO.: 99900289/82-02	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS

1. (Open) Unresolved Item C (82-01): Low bolting torque values.

   The inspector did not evaluate this item during this inspection.

2. (Open) Nonconformance B (82-01): Failure to accomplish design changes in accordance with paragraph 3.5.3, Section 3 of the Nuclear Products Quality Assurance Manual.

   The inspector did not evaluate this item during this inspection.

E. OTHER FINDINGS OR COMMENTS:

The purpose of the inspection was to observe the B-W qualification test program to qualify a valve actuator for use in a nuclear plant in a harsh environment. More specifically, the inspection was conducted to verify that qualification of this valve actuator for the Waterford-3 nuclear plant was being pursued in compliance with approved test plans and procedures that meet the test criteria of IEEE Standard 323-1974 and NRC NUREG 0588, Rev. 1, and that the testing would be done in a test facility capable of testing to LOCA conditions.

B-W had developed a valve actuator and had completed the prototype testing of a unit as a candidate for operation in a LOCA environment. They had completed details of a qualification test procedure that appeared adequate for qualification testing of the candidate valve actuator.

The National Technical Systems (NTS) test facility, Saugus, California, had been selected by B-W to conduct the qualification testing.

ORGANIZATION: BORG-WARNER
NUCLEAR VALVE DIVISION
VAN NUYS, CALIFIORNIA

REPORT NO.: 99900289/82-02	INSPECTION RESULTS:	PAGE 3 of 3

The inspector visited the NTS facility as a guest of the B-W Manager, Remote and Manual Operators. The NTS management gave a presentation of the organizational structure and test facility capabilities for conducting tests to a LOCA environment. Details of the proposed qualification test schedule were examined. NTS agreed with the request by B-W that NRC Equipment Qualification Engineers inspect, examine, and witness selected phases of the total qualification test program, including related documented analyses and data.

ORGANIZATION: BURNS AND ROE, INCORPORATED
ORADELL, NEW JERSEY

REPORT NO.: 99900503/82-02	INSPECTION DATES 6/7-11/82	INSPECTION ON-SITE HOURS: 38

CORRESPONDENCE ADDRESS: Burns and Roe, Incorporated
ATTN: Mr. T. A. Hendrickson
Assistant to the President
550 Kinderkamack Road
Oradell, NJ 07649

ORGANIZATIONAL CONTACT: Mr. W. P. Rausch, Director of QA
TELEPHONE NUMBER: (201) 265-9351

PRINCIPAL PRODUCT: Architect Engineering and Consulting Services

NUCLEAR INDUSTRY ACTIVITY: The total effort committed to domestic nuclear activities is approximately 36% of the 2500 employee staff. Major projects include the design of Washington Public Power Supply System, Unit 2, Clinch River Breeder Reactor, post accident conditions update for Three Mile Island, Unit 2, and design verification for Oyster Creek.

ASSIGNED INSPECTOR: C J Hale / for
D. F. Fox, Reactor Systems Section (RSS) 7/29/82 Date

OTHER INSPECTOR(S):

APPROVED BY: C J Hale
C. J. Hale, Chief, RSS 7/29/82 Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and Topical Report B&ROE-COM4-1-NP.

B. SCOPE: Determine the status of previous inspection findings and a design inspection (validation of computer codes).

PLANT SITE APPLICABILITY: WNP-2, Docket No. 50-397.

ORGANIZATION: BURNS AND ROE, INCORPORATED
ORADELL, NEW JERSEY

REPORT NO.: 99900503/82-02	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATIONS:

None.

B. NONCONFORMANCES:

1. Contrary to Burns and Roe (B&R) Topical Report, paragraph 2.1 of Chapter VI, superseded revision 0 of procedure (Computer) "Program Approval and Certification," was not removed by the designated coordinator from the controlled copy of the Corporate Operations Manual assigned to the B&R Woodbury facility library.

2. Contrary to B&R Topical Report and implementing procedure "Abstracts of Available Programs," the latest issue of the Computer Program Index did not list: (1) all engineering and design programs available to B&R computer users; (2) the advisor's name for all programs that were listed in the index.

3. Contrary to B&R Topical Report and implementing procedure "Program Approval and Certification," none of the currently available vendor-supplied programs listed in the latest issue of the Computer Program Index were designated as "Certified-V" even though they were available for use by B&R computer users.

4. Contrary to B&R Topical Report and committed ANSI N45.2.11, procedures were not available, or not employed to:

   a. Control the distribution of computer program manuals to appropriate users activities;

   b. Maintain and retain documents needed to provide traceability and to support "certified" computer programs with the status of a QA record;

   c. Require independent verification/validation of computer programs;

   d. Determine the cause of significant deficiencies in computer programs and implement corrective actions in the QA program to prevent their recurrence;

   e. Disseminate computer program experience reports to cognizant design personnel;

f. Assure that the impact of changes to computer programs are considered and that the changes be subjected to design control measures that were, or should have been, applied to the original computer program.

C. UNRESOLVED ITEMS:

None.

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Nonconformance (82-01): Procedure WNP-2-ED-003, "Reporting of Defects and Noncompliance - Nuclear Projects," did not include the latest issue of 10 CFR Part 21 regulations as required.

   B&R revised Project Instruction WNP-2-ED-003 on March 5, 1982, to reflect the current issue of 10 CFR Part 21 as committed. The B&R Licensing Department was advised to monitor the daily Federal Register for changes in the 10 CFR Part 21 regulations and to notify the B&R projects of any changes therein. Quality Assurance stated that they will review procedure WNP-2-ED-003 semiannually to assure that it is current.

2. (Open) Nonconformance (82-01): The B&R Richland, Washington, office controlled set of WNP-2 Project Instructions contained superseded revision 4 of WNP-2-ED-010.

   Action on this item was deferred pending receipt of the B&R response to the Notice of Nonconformance transmitted by NRC Inspection Report 99900503/82-01.

3. (Open) Nonconformance (82-01): Certain subanalyses of design calculation 5.51.053 were not identified as to status, not checked, nor verified as required by procedure WNP-2-ED-010.

   Action on this item was deferred pending receipt of the B&R response to the Notice of Nonconformance transmitted by NRC Inspection Report 99900503/82-01.

E. OTHER FINDINGS OR COMMENTS:

Design Inspection (Validation of Computer Codes) - The B&R Topical Report, Corporate Quality Assurance Manual, and implementing procedures were reviewed to determine the commitments and requirements relative to the development, control, and utilization of digital computer codes developed by B&R, or

supplied by a vendor, that are used in the design or analysis of safety-related structures, systems, and components.

Computer program development and action requests; program descriptions and their abstracts; design, users and operations manuals; source coding (program listings); job control cards, sample inputs to computer runs and their corresponding outputs; test cases, code validation/certification data; and other documentation related to the following codes were reviewed to verify implementation of topical and procedural commitments:

(1) APEC-PIPE, used for piping friction loss analysis;
(2) PDROP, used for pipe sizing and pressure drop analysis;
(3) HYDRAIN, used for heater drain piping analysis;
(4) VESA, used for earthquake vertical spectrum analysis;
(5) VETHA, used for earthquake vertical time history analysis;
(6) WATRAN, used for water hammer transient analysis of piping systems;
(7) SHORTCKT, used for short circuit analysis of AC electrical systems;
(8) DC SYSTEM, used for analysis of DC electrical systems;
(9) ORIGEN2, used to calculate fission product source terms; and
(10) ARMS, used to determine optimum routing of electrical cables.

Four nonconformances were identified in this area of the inspection (see B above). Further, the inspector noted that existing procedures: (1) permit computer codes classified as "Approved" to be used for production work/analyses without specifically requiring that they be validated/verified to assure that the code accurately implements the intended analytical methodology and algorithms; and (2) permits exclusion of minicomputers and stored program programmable calculators from the requirements for program approval certification, and security under certain conditions.

ORGANIZATION: CHEM-NUCLEAR SYSTEMS, INC.
BELLEVUE, WASHINGTON

REPORT NO.: 99900776/82-01	INSPECTION DATE(S) 5/17-19/82	INSPECTION ON-SITE HOURS: 20

CORRESPONDENCE ADDRESS: Chem-Nuclear Systems, Inc.
ATTN: Mr. B. Johnson, President
P. O. Box 1866
Bellevue, Washington 98006

ORGANIZATIONAL CONTACT: Mr. B. Svinis, Quality Assurance Manager
TELEPHONE: (206) 827-0711

PRINCIPAL PRODUCT: Transportation and storage of nuclear waste materials.

NUCLEAR INDUSTRY ACTIVITY: Total activity is devoted to transportation and storage of nuclear waste materials.

ASSIGNED INSPECTOR: J. T. Conway for
W. M. McNeill, Reactive & Components Program Section (R&CPS) 7-30-82 Date

OTHER INSPECTOR(S):

APPROVED BY: James T. Conway for
I. Barnes, Chief, R&CPS 7-30-82 Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 71, Appendix E and 10 CFR Part 21.

B. SCOPE: This inspection was made as a result of a Part 21 report issued by Chem-Nuclear Systems on a missing shield ring in the two Vandenburgh model spent fuel shipping casks.

PLANT SITE APPLICABILITY: Not identified.

ORAGNIZATION: CHEM-NUCLEAR SYSTEMS, INC.
BELLEVUE, WASHINGTON

REPORT NO.: 99900776/82-01	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATIONS:

None

B. NONCONFORMANCES:

Contrary to Criterion 5 of Appendix E to 10 CFR Part 71 and procedure CN-AD-015, several nonconforming conditions (e.g., (1) missing shield rings on both casks; (2) a missing vent valve on cask Serial Number 2; and (3) the use of Buna N and not silicone rubber O-rings on both casks) were identified on the Vandenburgh model casks without being documented on NCR forms.

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Cask Design

The Vandenburgh model cask is a cylinder with approximate dimensions of 11 feet in height and 4 feet in diameter which contains 6 inches of lead shielding encased in steel. The base plate or lid is fastened to the cask body with 12-1½" bolts and nuts. The cask inside diameter is 3 feet with a height of under 10 feet. The gross weight is 35 tons. The weight of contents shipped is limited to about 4½ tons.

2. Part 21 Report

On March 11, 1982, Chem-Nuclear Systems (CNS) reported to the NRC that two Vandenburgh model casks were missing shield rings. During the consolidation and rewrite of Certificate of Compliance (C of C) 5805, it was discovered that a ring assembly, identified on a supplement (dated October 5, 1975) to the C of C, was missing. This shield ring provides protection from radiation streaming in the event of the 30 foot drop accident condition. The ring is made of 3/4-inch steel plate with a lead annulus, and is required to be bolted to the inside of the cask cover, with the fuel basket in turn bolted to it. In addition, it was noted by CNS that the Serial Number 2 cask was missing a vent valve on the drain line, and both casks had Buna N O-rings and not silicone. A new set of shield rings have been made, installed, and the casks are waiting inspection. New liner tanks are being fabricated that will accommodate the required ring assemblies. The O-rings have been replaced and the vent valve added. This corrective action appears satisfactory.

ORGANIZATION: CHEM-NUCLEAR SYSTEMS, INC.
BELLEVUE, WASHINGTON

REPORT NO.: 99900776/82-01	INSPECTION RESULTS:	PAGE 3 of 4

A generic review program has been established of all C of C's held by CNS to verify that all information on C of C's and Safety Analysis Reports (SAR's) is consistent and on file at CNS. During the inspection it was determined that no specific provisions had been made to verify compliance of the hardware to: (1) the C of C; (2) drawings referenced on the C of C; and (3) the SAR. This item will be reviewed during a subsequent inspection to ascertain how the above verification of the hardware was accomplished. With the exception of the above comment, the preventive action appears satisfactory.

The established Part 21 procedure did not clearly state: (1) that an evaluation of the defect or substantial safety hazard be performed before reporting (Part 21 report was filed with the NRC on March 11, 1982, prior to evaluation); (2) the identity of the designated director or responsible officer; (3) the requirement for notification to the NRC of a reportable defect; and (4) that each procurement document when applicable specifies that the provisions of 10 CFR Part 21 apply. This item will be further reviewed during a subsequent inspection.

3. Cask Fabrication/Design History

There are two Vandenburgh model casks. The first cask was made for Yankee Atomic Electric Company in 1962 and acquired by Atcor Company in August 1966. The second cask was made by PX Engineering in June 1969 for Atcor Company. These casks were used for spent fuel shipments of the BONUS, Piqua, Pathfinder, Elk River, and La Cross projects. In 1975, the analysis of lead slump under drop conditions was questioned by the NRC. A reanalysis showed that the lead slump would be 4 inches, and this precipitated the design changes to add a lead shield ring to the La Cross fuel basket assembly used inside the casks. The NRC approved the design change submitted in the October 9, 1975, supplement to the SAR for the cask. In a supplement dated December 2, 1975, the NRC approved the cask's usage for nonfissile waste shipments. Waste shipments were made using a liner tank inside the cask. The design of the liner tanks did not include a shield ring. There is some ambiguous information in the supplements relating to the liner; e.g., the weight of the cask is reported heavier by approximately the weight of the ring assembly, and in another case, there was insufficient axial gap to allow for a ring. It would appear Atcor associated the shield ring with only spent fuel shipments.

In August 1978, CNS acquired the Atcor Company and, thereby, the Vandenburgh casks and three other models of casks on C of C's 5026, 6601, and 9108. Although CNS did inspect these five casks at the time acquired, it appears that they did not do a complete review of the documentation i.e., the C of C's and SAR's. Since the acquisition, CNS has used these casks for five waste shipments, but no spent fuel.

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ORGANIZATION: CHEM-NUCLEAR SYSTEMS, INC.
BELLEVUE, WASHINGTON

REPORT NO.: 99900776/82-01	INSPECTION RESULTS:	PAGE 4 of 4

As a result of the apparent failure of the cask designer to incorporate shield rings in the liner design for waste shipments, shield rings have not been used for waste shipments by CNS. The problem was compounded further by CNS, in that not all cask documentation was reviewed for completeness at the time of acquisition. CNS has completed a review of the Vandenburgh model's software and established a program review of all its C of C's. In addition, CNS has a 10 CFR Part 71, Appendix E, QA program in place that addresses design control and procurement controls, which, if implemented, should preclude recurrence of this type of a problem in the future.

ORGANIZATION: CHICAGO BRIDGE & IRON COMPANY
SALT LAKE CITY, UTAH

REPORT NO: 99900784/82-01	INSPECTION DATE(S): 7/26-30/82	INSPECTION ON-SITE HOURS: 56

CORRESPONDENCE ADDRESS: Chicago Bridge & Iron Company
ATTN: L. I. Christofferson
Plant Manager
550 West 17th Street
Salt Lake City, Utah 84115

ORGANIZATIONAL CONTACT: R. A. Bonina, Superintendent, Welding & Quality Assurance
TELEPHONE NUMBER: (801) 973-2500

PRINCIPAL PRODUCT: Nuclear Component Supports

NUCLEAR INDUSTRY ACTIVITY: 40% of production devoted to nuclear products.

ASSIGNED INSPECTOR: H. W. Roberds — 8/18/82
H. W. Roberds, Reactive and Component Program Section (R&CPS) — Date

OTHER INSPECTOR(S): I. Barnes, Chief, R&CPS

APPROVED BY: I. Barnes — 8/19/82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made as a result of the identification of weld deficiencies in restraint assemblies that have been furnished to the Comanche Peak Steam Electric Station, Units 1 and 2. Areas selected for inspection included: NDE personnel qualification; nondestructive examination (magnetic particle and visual); nonconformance and corrective examination; manufacturing process control; welding procedure specifications; welding material
(cont. on next page)

PLANT SITE APPLICABILITY:

50-445; 50-446

ORGANIZATION: CHICAGO BRIDGE & IRON COMPANY
SALT LAKE CITY, UTAH

REPORT NO: 99900784/82-01	INSPECTION RESULTS:	PAGE 2 of 7

B. SCOPE: cont.
control; joint fitup and production welding; weld heat treatment; visual examination of welds; and welder performance qualification.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 14.0 of the Nuclear Quality Assurance Manual, repairs were not controlled and documented on a Repair Checklist for weld buildups on Contract No. 82105 (Comanche Peak), Assemblies 609-11-1-2, 609-18-2, and 609-4-2.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 14.0 of the Nuclear Quality Assurance Manual, completion of disposition had not been signed off by the Nuclear QA Coordinator on the Nonconformance Control List for Contract No. 82105B, NCCL8.6.2, Items 6, 7, 8, 9, 10, and 13, although all the actions necessary to resolve the nonconformity had been completed.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 8.0 of the Nuclear Quality Assurance Manual, a weld (Area K) was observed being performed on Contract No. 82105, Pipe Restraint Assembly 1007-A, which had not been either originally identified on, or added to, the Daily Weld Material Distribution Log by a Welding QA Supervisor or storage attendant.

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50, Section 8.0 of the Nuclear Quality Assurance Manual and General Welding Procedure Specification GWPS-SMAW (WPS800), Revision 10:

   a. The Preheat-Interpass Monitoring Log for Contract No. 82105, Pipe Restraint Assembly 801-A, was not maintained with respect to checking of required preheat for performance of a weld repair made after final assembly postweld heat treatment.

   b. Welding was commenced after torch preheating of Area K of Contract No. 82105, Pipe Restraint Assembly 1007-A, without checking to ascertain that the required minimum 250^{o} F preheat temperature had been reached.

ORGANIZATION: CHICAGO BRIDGE & IRON COMPANY
SALT LAKE CITY, UTAH

REPORT NO: 99900784/82-01	INSPECTION RESULTS:	PAGE 3 of 7

5. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 8.0 of the Nuclear Quality Assurance Manual, surveillance over welders was not maintained throughout welding operations on Contract No. 82105, Pipe Restraint Assembly 1007-A, to assure that the proper welding procedure was being followed, as evidenced by the observation of the use of flux core arc welding for Area B, in addition to the shielded metal arc welding process permitted by the applicable Shop Checklist.

6. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 10.0 of the Nuclear Quality Assurance Manual, postweld heat treatment (PWHT) was performed for dimensional purposes on Contract No. 82105, Pipe Restraint Assemblies 806-A, 807-A and 860-A, without either designating PWHT or incorporating heat treating requirements on the process control documents (Shop Checklists).

7. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 8.0 of the Nuclear Quality Assurance Manual, the following examples were identified during review of welder performance qualification records, of both failure to record and incorrect recording of qualification information on the welder qualification master sheet:

   a. A January 3, 1978, 2G (horizontal) position shielded metal arc welder performance qualification had been entered on the master sheet as a 3G (vertical) position performance qualification.

   b. An October 21, 1981, stud welder performance qualification had not been entered on the master sheet; and for the same individual a May 6, 1982, stud welder performance qualification had been entered on the master sheet as being performed on May 6, 1981.

   c. An October 14, 1981, gas metal arc welder performance qualification had not been entered on the master sheet.

8. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Procedure GR-100N, Revision 0, no records were available which would indicate a dimensional inspection (including measurement of repair depth) had been performed on a surface that was repaired after final PWHT on Contract No. 82105, Pipe Restraint Assembly 801-A.

9. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraphs QW-201.1 and QW-201.2 in Section IX of the ASME Code, Welding Procedure Specification WPS DS88-F3/82105 permitted a change in an essential variable (QW-403.9) for the gas metal arc welding process from that qualified by the supporting Procedure Qualification Record (PQR), and for which requalification had not been performed.

ORGANIZATION: CHICAGO BRIDGE & IRON COMPANY
SALT LAKE CITY, UTAH

REPORT NO: 99900784/82-01	INSPECTION RESULTS:	PAGE 4 of 7

C. UNRESOLVED ITEMS:

The NRC inspectors were unable to establish from review of QA program requirements, and inspection of process control documentation, that the Nuclear Quality Assurance Manual, Issue 8, makes adequate provision for assuring performance of required inspection activities associated with repair welding of materials and/or assemblies.

The QA program permits, if there is an existing approved repair procedure, to collectively group repairs and required examinations under a single line entry on a Shop Checklist. This results in a single signoff for inspection and nondestructive examination of all repairs. It could not be ascertained, however, from review of the QA program, what provisions existed that would assure either performance of inspections/examinations required to be carried out in concert with repairs, or would allow inspection/NDE personnel to physically identify all repaired areas after completion.

During the inspection a review was made of the process control documentation for Contract No. 82105, Pipe Restraint Assembly 1006-A, with respect to repair history. The process control documentation indicated that a weld repair had been made, but that a required magnetic particle examination of the repair had currently not been performed. Visual examination of the assembly failed to indicate the location of the repair.

D. OTHER FINDINGS OR COMMENTS:

1. NDE Personnel Qualification - The NRC inspector reviewed Section 9.0 of the Nuclear Quality Assurance Manual, "Nondestructive Examination." To verify that nondestructive examination personnel were trained, qualified and certified in accordance with SNT-TC-1A, as required by Section III of the ASME Code, a review was made of procedures governing these activities and current records for six Level II technicians for magnetic particle, radiography, liquid penetrant, and visual examination methods. The specific records examined consisted of: NDE education and experience; written SNT-TC-1A examinations; and certification history including current eye examinations.

   Within this area of inspection, no nonconformances or unresolved items with respect to NRC, contractual, or QA program requirements were identified.

2. Nondestructive Examination (Magnetic Particle and Visual) - To verify that magnetic particle and visual examinations are performed by qualified personnel using approved procedures which comply with contractual and NRC requirements, a review was made of the qualifications of personnel and procedures that had been used for magnetic particle and visual examination of a pipe restraint assembly that had been fabricated and shipped to the Comanche Peak Steam Electric Station. The procedures were examined for compliance to the requirements of Section V of the ASME Code and to assure that the acceptance standards were as delineated in Subsection NF of Section III of the ASME Code. Personnel qualifications were reviewed to ascertain that they were currently certified in accordance with SNT-TC-1A requirements.

   Within this area of inspection, no nonconformances or unresolved items with respect to NRC, contractual or QA program requirements were identified.

3. Nonconformances and Corrective Action - The NRC inspector reviewed Section 14.0 of the Nuclear Quality Assurance Manual, "Nonconformities and Corrective Action," to verify that a system has been initiated for the control of nonconformances, including reporting, disposition, documentation and establishment of corrective actions for identified discrepant conditions. To verify that the system was implemented, a review was made of the Nonconformance Control List for Contract Nos. 82105 and 03271.

   Within this area of inspection, two nonconformances were identified (see paragraphs B.1 and B.2).

4. Manufacturing Process Control - The NRC inspector reviewed Section 7.0, "Process Control," and Section 8.0, "Welding," of the Nuclear Quality Assurance Manual, to verify that a system had been established for the control of fabrication, which was consistent with NRC, code and contractual requirements. Two repair procedures were reviewed and an evaluation of six Shop Checklists and in-process manufacturing operations performed, with specific attention given to: (a) definition of and control of sequencing of manufacturing operations; (b) compliance with any designated hold points; (c) performance of designated inspections and nondestructive examinations; (d) evidence of definition of required fabrication inspection and performance consistent with QA program commitments; (e) completeness of operation signoff; (f) performance of operations by appropriately qualified personnel; and (g) definition of identity of applicable procedures and instructions.

Within this area of inspection, three nonconformances (see paragraphs B.3, B.6, and B.8) and one unresolved item (see paragraph C.) were identified.

In addition to paragraph C above, the following pertinent information on the same subject was obtained during the inspection of Non-conformances and Corrective Action. From a review of Shop Checklists, it could not be ascertained that a required magnetic particle examination of plate edge weld buildups on Assembly Nos. 609-11-1-2, 609-18-2 and 609-4-2 had been accomplished. Examination of the process control documentation showed that magnetic particle examination was signed off after all assembly welding had been completed. Performance of weld buildup examinations could not be fully accomplished after completion of welding, in that buildup surfaces would then be inaccessible for examination.

5. Control of Welding - The NRC inspector reviewed Section 8.0, "Welding," of the Nuclear Quality Assurance Manual, to verify that systems had been established which would provide for qualification and performance of welding operations in accordance with NRC, code, and contractual requirements. Specific welding subject areas reviewed and findings were as follows:

   a. Welding Procedure Specifications

      A review was performed of the shielded metal arc (SMAW) and gas metal arc (GMAW) welding procedure specifications (WPS) and supporting PQR's, which had been approved for application on Contract No. 82105. General WPS's for these two welding processes were also reviewed and an evaluation performed of the above documents with respect to ASME Code Section IX essential and non-essential variables.

      Within this area of inspection, one nonconformance was identified (see paragraph B.9).

   b. Welding Material Control

      A review was performed of procurement specification requirements for SMAW and GMAW materials utilized in restraint assembly fabrication, and an examination made of vendor certification for materials currently listed as approved for use. Electrode ovens were inspected with respect to material traceability and conditioning practices, and an inspection performed of issue practices for two welding stations.

ORGANIZATION: CHICAGO BRIDGE & IRON COMPANY
SALT LAKE CITY, UTAH

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Within this area of inspection, no nonconformances or unresolved items were identified.

c. Joint Fitup and Production Welding

An inspection was performed at two welding stations of welder compliance with WPS requirements and a review made of Weld Material Distribution and Preheat-Interpass Monitoring Logs with respect to fabrication of six assemblies.

Within this area of inspection, two nonconformances were identified (see paragraphs B.4 and B.5).

d. Visual Examination of Welds

This area of inspection could not be accomplished, as a result of the shipment of all presently completed assemblies prior to the inspection.

e. Weld Heat Treatment

A review was performed of Section 10.0, "Heat Treating," of the Nuclear Quality Assurance Manual, the procedure used for heat treatment of pipe restraint assemblies, calibration records for furnace temperature recorders, and heat treatment records (charts, thermocouple location sketches) for two furnace runs containing pipe restraint assemblies.

Within this area of inspection, no nonconformances or unresolved items were identified.

f. Welder Performance Qualification

A review was performed of performance qualification files for six welders and a comparison made against the welder qualification master sheet. Additionally, qualifications of personnel were verified for welding operations observed being performed on production assemblies.

Within this area of inspection, one nonconformance was identified (see paragraph B.7).

ORGANIZATION: CLOW CORPORATION
CLOW ENGINEERED PRODUCT DIVISION
WESTMONT, ILLINOIS

REPORT NO.: 99900396/82-01	INSPECTION DATES: 7/12-16/82	INSPECTION ON-SITE HOURS: 30

CORRESPONDENCE ADDRESS: Clow Corporation
Clow Engineered Product Division (CEP)
ATTN: Mr. M. L. Seshagiri, Quality Assurance Manager
40 Chestnut Avenue
Westmont, Illinois 60559

ORGANIZATIONAL CONTACT: Mr. M. L. Seshagiri, Quality Assurance Manager
TELEPHONE NUMBER: (312) 325-6000

PRINCIPAL PRODUCT: High Pressure Butterfly and Check Valves.

NUCLEAR INDUSTRY ACTIVITY: Commercial nuclear valve production of Clow Engineered Product Division totals 60% of total production. Four contracts are presently in-house for current and future production. CEP's Certificate of Authorization expires in November 1982.

ASSIGNED INSPECTOR: J Barnes for J. W. Sutton, Reactive & Component Program Section (R&CPS) — 9-16-82 Date

OTHER INSPECTOR(S):

APPROVED BY: J Barnes I. Barnes, Chief, R&CPS — 9-16-82 Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and 10 CFR Part 21.

B. SCOPE: 10 CFR Part 21 inspection, nonconformance/corrective action, process control, (machining), and calibration.

PLANT SITE APPLICABILITY: Not identified.

ORGANIZATION: CLOW CORPORATION
CLOW ENGINEERED PRODUCT DIVISION
WESTMONT, ILLINOIS

REPORT NO.: 99900396/82-01	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCES:

Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 10, paragraph 10.1 of the QA Manual, use of only equipment with unexpired calibration dates was not assured, as evidenced by the observation of two measuring instruments being utilized in shop machining operations which had exceeded their calibration dates.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

None

E. OTHER FINDINGS OR COMMENTS:

1. 10 CFR Part 21 Inspection: The NRC inspector reviewed CEP's written policy used for the evaluation of identified component defects that could be reportable under 10 CFR Part 21 requirements. The inspector reviewed CEP's reporting procedure EPS No. 30-19-694. Posting of Part 21 requirements was checked and found to meet posting requirements. The inspector determined that the requirements for reporting and posting under 10 CFR Part 21 have been complied with as required by the regulation.

2. Nonconformance/Corrective Action: The NRC inspector reviewed CEP's QA Manual Section 12, "Nonconforming Items." The inspector also reviewed 25 deficiency reports, Material Review Board reports, and Quality Trend Analysis for contents. Associated documents and records were reviewed to determine compliance to QA Program requirements. The corrective action taken to prevent recurrence was examined for implementation. Areas designated for segregation of nonconforming items were inspected. Relative to the documents examined, the inspector determined that activities were in conformance with the QA program requirements and were being implemented as required.

ORGANIZATION: CLOW CORPORATION
CLOW ENGINEERED PRODUCT DIVISION
WESTMONT, ILLINOIS

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During the inspector's review of CEP's deficiency reports, it was noted that some material purchased for fabrication of 28 valves had been heat treated more than once. Further review showed that the material was purchased for the manufacture of replacement valves for the Donald C. Cook generating plant which had been ordered by the American Electric Power Service Corporation in Purchase Order 0035-041-2X. Due to specification interpretation, materials for the valves were purchased by Clow Engineered Products Division from vendors who had not been approved in accordance with QA program requirements. This discrepancy was brought to the attention of the NRC Region III Office for review and resolution.

3. Manufacturing Control (Machining): The NRC inspector reviewed CEP's QA Manual, Section 5, "Manufacturing Control," and witnessed ongoing machine work within the shop. The inspector reviewed shop travelers, procedures, drawings, and related documentation for two jobs in progress. As a result of the review of this documentation, the inspector determined that machining operations were being performed as required by the QA Program requirements.

4. Calibration: The NRC inspector reviewed CEP's QA Manual Section 10, "Gage and Measuring Equipment Control." Measurement tools being used for measurement acceptance were checked for the calibration dates and compliance to QA/QC procedures. Procedures, records, and associated documentation were checked for compliance to QA Manual requirements. During the course of the inspection, it was observed that two measurement instruments were being used for product acceptance, even though the calibration label indicated that the equipment had not been calibrated as required by the due date. (See Section B of inspection results.)

ORGANIZATION: COMBUSTION ENGINEERING, INC.
NUCLEAR POWER SYSTEMS DIVISION
HEMATITE, MISSOURI

REPORT NO.: 99900102/82-01	INSPECTION DATES: 7/12-15/82	INSPECTION ON-SITE HOURS: 24

CORRESPONDENCE ADDRESS: Combustion Engineering, Inc.
ATTN: Mr. H. V. Lichtenberger
Vice-President Manufacturing
1000 Prospect Hill Road
Windsor, Connecticut 06095

ORGANIZATIONAL CONTACT: Mr. M. R. Thomas, Quality Assurance Manager
TELEPHONE: (203) 688-1911 ext. 5774

PRINCIPAL PRODUCT: Nuclear fuel assemblies and control rod drives.

NUCLEAR INDUSTRY ACTIVITY: Nuclear fuel and control rod drive supplier for CE designed cores.

ASSIGNED INSPECTOR: _____ 8-10-82
W. M. McNeill, Reactive and Component Program Section (R&CPS) — Date

OTHER INSPECTOR(S):

APPROVED BY: _____ 8-10-82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: Enrichment and impurity controls; pellet attributes; handling, storage and shipping; and status of previous inspection findings.

PLANT SITE APPLICABILITY: Not identified.

ORGANIZATION: COMBUSTION ENGINEERING, INC.
NUCLEAR POWER SYSTEMS DIVISION
HEMATITE, MISSOURI

REPORT NO.: 99900102/82-01	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 2, paragraph 2.6.1 of the QA Manual, resintering testing, identified in Work Orders H-65 and H-66, had not been planned for the required work to be performed.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 7, paragraph 7.2 of the QA Manual, determination of grain size was observed during the inspection as not being executed in accordance with the applicable operation sheet; i.e., different microscope, objective lens, filters, etc., were in use than that required by the operation sheet.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

(Closed) Unresolved Item (77-01): The Quality Assurance Manual was found to be out of date.

A revision of the QA Manual has been issued. A review of shop activities found this manual to be implemented with the exceptions noted below.

E. OTHER FINDINGS OR COMMENTS:

1. Enrichment and Impurity Controls - The use of sampling plans to control pellet manufacture was inspected. Compliance to the Work Order and specification chemistry requirements was verified. Administrative controls such as labels, pellet identification, etc., were verified. The use of travelers and Operation Sheets to control manufacturing was inspected and found to follow established procedures. The measures established for material control and identification of the inspection status of pellets were verified.

2. Pellet Attributes - Compliance to the Work Order, drawing and specification requirements was verified. The sampling for density, dimensional, surface and other physical characteristics were inspected and found to follow the written procedures. The controls for rework and nonconformances were verified. The records of inspection and testing of two recent lots were reviewed. The inspection procedures were reviewed and

inspection activities observed. The controls of the sintering process were checked and one nonconformance (B.1 above) on resintering was identified. The Work Order and its referenced specification identified a requirement for resintering testing to be performed. However, the Hematite Plant does not have the capabilities to sinter in the specified atmosphere. No exception had been taken to the Work Order by the Hematite Plant. In the review of the testing of pellet microstructure, a nonconformance (B.2 above) was identified. It appears that the procedure in question has become out-of-date. A general observation of the inspection procedures was that the inspection frequencies were sometimes controlled by memorandum rather than by the procedures. It was further noted that tolerances had not been established in procedures for furnace gas flow rates, cooling temperatures, etc.

3. Handling, Storage and Shipping - The Hematite Plant is pelletizing CE Windsor's plant schedule overload. Normally the Hematite Plant is only a material supplier of UO_2 powder for pelletizing. The pellets manufactured by the Hematite Plant are shipped to the CE Windsor Plant for fuel rod loading. It was established by this inspection that shipping activities were not inspected by QA. This was determined, however, not to be a nonconformance with the established QA Manual and Work Order. Shipping activities were verified as being performed in accordance with manufacturing procedures.

ORGANIZATION: COMSIP, INC.
INSTRUMENT AND CONTROL SYSTEMS
WHITTIER, CALIFORNIA

REPORT NO.: 99900734/82-02	INSPECTION DATES: 4/13-14/82	INSPECTION ON-SITE HOURS: 32

CORRESPONDENCE ADDRESS: Compsip, Inc.
Instrument and Control Systems
ATTN: Mr. A. D. Robinson
Vice President and Technical Director
3030 Red Hat Lane
Whittier, CA 90601

ORGANIZATION CONTACT: Mr. A. D. Robinson
TELEPHONE: (213) 692-9021

PRINCIPAL PRODUCT: Hydrogen Analyzers

NUCLEAR INDUSTRY ACTIVITY: Comsip, Inc., at the Whittier, California, facility has a force of approximately 45 employees. Their principal product is a hydrogen analyzer (HA) which comprises approximately 75% of their volume of work: 100% of the HA's are for the nuclear industry. The remainder of the products is fabrication of instrument panels. These HA's have been purchased by 41 utility companies for approximately 68 nuclear units.

ASSIGNED INSPECTOR: J. R. Agee, Equipment Qualification Section (EQS) — Date: 8/10/82

OTHER INSPECTOR: A. L. Smith, EQS

APPROVED BY: for H. S. Phillips, Chief, EQS — Date: 8/13/82

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B

B. SCOPE: This inspection was made as a result of an allegation received by the NRC Region V office on October 26, 1981. The allegation concerned inadequate qualification of the Delphi Containment Air Analyzer Model No. K-3 and K-4.

PLANT APPLICABILITY: Not identified.

ORGANIZATION: COMSIP, INC.
INSTRUMENT AND CONTROL SYSTEMS
WHITTIER, CALIFORNIA

REPORT: NO.: 99900734/82-02	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Background

An allegation was submitted to Region V by telephone on October 26, 1981, by an anonymous caller who stated that the "defective" product was manufactured by a competitor of his company and was being provided as a safety-related component to nuclear power plants. The caller initially refused to specifically identify the product, but in a second phone call (approximately one hour after the first phone call) a second individual identified the Containment Hydrogen Monitor or Containment Air Analyzer Model No. K-3 and K-4, manufactured by Delphi Instruments Division of Comsip, Inc., Whittier, California. The caller stated: "The instrument has not been properly qualified, and will, most likely, not operate when required due to poisoning of the catalyst. Page 7 of NUREG 0588, requires qualification tests of the equipment. Delphi has not performed these qualification tests. One test calls for caustic sprays with boric acid (a catalyst poison). If they had done this test, they would probably find that the catalyst in the instrument will not properly function and the instrument will be functionally inoperative or reflect a large degree of error. There are numerous other catalyst poisons which must also be considered and Delphi did not consider these; e.g., silicon oil spray. Delphi certified that these components have been properly tested and qualified, yet to my knowledge this was not done."

2. Allegation No. 1

The Delphi hydrogen analyzer has not been properly qualified, and will, most likely, not operate when required due to poisoning of the catalyst.

Engineering Analysis and Test Company (EA&T), Inc., Test Report, "IEEE-323-1974 Qualification of Delphi IV Hydrogen Analyzer," Project: 1035-1, dated December 1980, contains data that demonstrated that the analyzer was tested and met the test criteria of IEEE Standard 323-1974 concerning thermal and radiation aging, mechanical cycling, seismic vibration and simulated post loss of coolant accident (LOCA) conditions. The test represented postulated conditions the analyzer might be subjected to following a LOCA. In conjunction with the above testing, the analyzer was calibrated by the test facility with a calibration gas containing a composition of approximately 9% Hydrogen (H_2) and 91% Nitrogen (N_2). The analyzer was then tested with a sample gas of known composition consisting of 5% H_2 and 95% N_2. The analyzer output signal corresponded proportionately to the known percentage of H_2 in the sample gas.

This allegation was not substantiated as the subject equipment had been environmentally qualification tested in accordance with IEEE-323-1974 and NUREG 0583 requirements.

3. Allegation No. 2

The analyzer will not properly function in the presence of certain catalyst poisons and Delphi failed to consider poisons such as boron spray and silicon oils.

Tests performed by Delphi indicate the analyzer, due to its unique design of having an order of magnitude more catalyst coating on the probe than is necessary, will not be significantly affected when exposed to the poisons mentioned.

The NRC inspector determined that Delphi had considered boron spray, silicon oils, and catalyst poisons, such as iodine, borated water, and phosphate esters and had concluded that:

ORGANIZATION: COMSIP, INC.
INSTRUMENT AND CONTROL SYSTEMS
WHITTIER, CALIFORNIA

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(a) Iodine poisoning is not possible for thermodynamic reasons.

(b) Phosphate esters in combination with steam and silicon oils have an insignificant effect on the catalyst.

(c) Boric acid would not be transported to an installed analyzer in a sample line controlled above the saturation temperature of the sample. In addition, the flow controlling capillary of the analyzer is protected by a ceramic wool fiber and the catalyst bed is protected by a sintered stainless steel diffusion barrier. Therefore, the sensing probe would not detect the boric acid.

(d) Water as a liquid, is separted from the sample in the H_2 analyzer, as proven in the qualification test.

This allegation was not substantiated since Delphi considered catalytic poisons as described above.

ORGANIZATION: CONSOLIDATED CONTROLS CORPORATION
A SUBSIDIARY OF CONDEC CORPORATION
BETHEL, CONNECTICUT

REPORT NO.: 99900221/82-01	INSPECTION DATE(S) 7/13-15/82	INSPECTION ON-SITE HOURS: 24

CORRESPONDENCE ADDRESS: Consolidated Controls Corporation
A Subsidiary of Condec Corporation
ATTN: Mr. John Engelberger
Vice President/General Manager
15 Durant Avenue
Bethel, CT 06801

ORGANIZATIONAL CONTACT: Mr. L. E. Goodsell, Jr., Manager-Quality Control
TELEPHONE NUMBER: (203) 743-6721

PRINCIPAL PRODUCT: Electronic instrumentation and control systems.

NUCLEAR INDUSTRY ACTIVITY: Not identified during this inspection.

ASSIGNED INSPECTOR: for V. E. Foster, Reactive & Component Program Section (R&CPS) 8-23-82 Date

OTHER INSPECTOR(S):

APPROVED BY: for I. Barnes, Chief, R&CPS 8-23-82 Date

INSPECTION BASES AND SCOPE:

A. BASES: Appendix B to 10 CFR Part 50 and 10 CFR Part 21.

B. SCOPE: This inspection was made as a result of the issuance of three 10 CFR Part 50.55(e) reports by the Tennessee Valley Authority. The reports pertained to deficient field buffer cards in the Solid State Control Systems that had been furnished to the Bellefonte Nuclear Plant,
(cont. on next page)

PLANT SITE APPLICABILITY:

Docket Nos.: 50-438/439.

ORGANIZATION: CONSOLIDATED CONTROLS CORPORATION
A SUBSIDIARY OF CONDEC CORPORATION
BETHEL, CONNECTICUT

REPORT NO.: 99900221/82-01	INSPECTION RESULTS:	PAGE 2 of 3

SCOPE: (Cont.) Unit Nos. 1 and 2. The deficiencies were identified as: (1) improper soldering; (2) capacitor failure; and (3) installation of incorrect resistors. In order to evaluate the adequacy of corrective actions and preventive measures, related to the deficient field buffer cards, the following areas were inspected: (1) change control; (2) design control; (3) manufacturing process control; (4) control of nonconformances and corrective actions; and (5) implementation of 10 CFR Part 21.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and Table No. 1 of the Inspection Checklist dated November 11, 1981, visual inspection in accordance with the applicable procedure had not been performed on reworked Field Buffer Modules, Part No. 6N193, Serial Nos. 010-1439, as evidenced by the TDS's, dated November 10, 1980 to June 28, 1982. The same is true of reworked Control Buffer Modules, Part No. 6N191, Serial Nos. 010-1869, reflected on TDS's dated November 11, 1981 to July 12, 1982.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and paragraph 6.3.1.2, of Quality Control Manual No. 2, Revision 6, dated August 1, 1981, Field Buffer Module, Part No. 6N193, Serial No. 033, had not been scrapped as dispositioned by Discrepancy Report No. 1-0962, dated November 13, 1981, as evidenced by the TDS which reflects an acceptable operating retest on June 11, 1982.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and paragraph 18.0 of Appendix A to the Tennessee Valley Authority Specification No. 2200:

   a. The date of test had not consistently been inserted in the TDS's for the Field Buffer Module, Part No. 6N193, and the Control Buffer Module, Part No. 6N191. A number of entries exhibited various days in November and December, but not the year.

   b. Actions taken in connection with noted deficiencies had not been entered in the TDS's for Part Nos. 6N191 and 6N193. For example, Discrepancy Report Nos. 2-0103, 2-0345, 2-0836, and 2-0410, had been initiated on various serial numbers of the noted part numbers; however, this information had not been entered in the TDS's for the affected part.

ORGANIZATION: CONSOLIDATED CONTROLS CORPORATION
A SUBSIDIARY OF CONDEC CORPORATION
BETHEL, CONNECTICUT

REPORT NO.: 99900221/82-01	INSPECTION RESULTS:	PAGE 3 of 3

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and paragraph II of Quality Control Instruction No. 057, dated April 21, 1978, revised quality control standards and quality control instructions had not been reviewed and approved by the Quality Control Manager or the Assistant Quality Control Manager.

5. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and paragraph 6.1 of Quality Control Manual No. 2, Revision 6, dated August 1, 1981, final test (operating retest) of the following reworked Field Buffer Modules, Part No. 6N193, had not been completed prior to submittal to the customer inspector: Serial Nos.: 062, 081, 139, 172, 223, 310, 317, 586, 625, and 661. This is evidenced by: (1) the lack of such indication (stamp, initials, etc.) at the appropriate location in the TDS's; (2) a completed TVA QC Checklist and Shipping Release No. 62, dated February 19, 1982; and (3) CCC's Invoice No. 2356, dated March 23, 1982, which indicated that the aforementioned hardware was shipped on Marcn 22, 1982.

6. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Table 1 of the Inspection Checklist, dated November 11, 1981, a burn-in test had not been conducted on the Controller Buffers, Part No. 6N191, after the replacement of transistors.

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

The Tennessee Valley Authority filed three 10 CFR Part 50.55(e) reports with the Region II office of the Nuclear Regulatory Commission. The reports pertained to deficient field buffer cards of the Solid State Control Systems that had been furnished to the Bellefonte Nuclear Plant, Unit Nos. 1 and 2. The deficiencies were identified as: (1) improper soldering; (2) capacitor failure; and (3) installation of an incorrect resistor.

Improper soldering and installation of an incorrect resistor appear to be the result of inadequate process control while the failure of capacitors resulted from in-rush current. Original design records were unavailable for review; consequently, the inspector was unable to determine the extent of design control during the initial design.

Paragraph B indicates that corrective actions and preventive measures are not totally adequate.

ORGANIZATION: CONTROL DATA CORPORATION
MINNEAPOLIS, MINNESOTA

REPORT NO.: 99900532/82-01	INSPECTION DATE(S) 7/27-30/82	INSPECTION ON-SITE HOURS: 27

CORRESPONDENCE ADDRESS: Control Data Corporation
ATTN: O. K. Staton
Vice President, COMSOURCE
P. O. Box 0, HQNO5R
Minneapolis, MN 55440

ORGANIZATIONAL CONTACT: Margo J. Berg, Manager, Application QA, COMSOURCE
TELEPHONE NUMBER: (612) 853-6327

PRINCIPAL PRODUCT: Data Service Applications and Consultant Services

NUCLEAR INDUSTRY ACTIVITY: In addition to their standard product offering, Control Data Corporation (CDC) sponsors 24 safety-related computer programs (applications), on their CYBERNET system. Current organizations accessing CYBERNET include licensees, architects and engineers, and engineering service organizations.

ASSIGNED INSPECTOR: R. H. Brickley 8/25/82
R. H. Brickley, Reactor Systems Section (RSS) Date

OTHER INSPECTOR(S):

APPROVED BY: C J Hale 8/25/82
C. J. Hale, Chief, RSS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21 and 10 CFR Part 50, Appendix B.

B. SCOPE: Inspection made in response to the following: (1) a request from NRC Office of Inspection and Enforcement (I&E) concerning your report of an error that CDC had identified in the computer program PIPESD; (2) a request from I&E concerning your report of an error that CDC had identified in the computer program PIPERUP; and (3) a construction deficiency report from RII and RIII concerning an error in the computer program
(cont. on next page)

PLANT SITE APPLICABILITY:

50-341, 50-390, 50-391, 50-566, and 50-567

ORGANIZATION: CONTROL DATA CORPORATION
MINNEAPOLIS, MINNESOTA

REPORT NO.: 99900532/82-01	INSPECTION RESULTS:	PAGE 2 of 5

SCOPE: (Cont.) BASEPLATE provided to Tennessee Valley Authority and Detroit Edison by CDC. In addition, an initial management meeting was held, and a QA program evaluation inspection was conducted.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

Contrary to the requirements of Criterion V of 10 CFR Part 50, Appendix B, and Section 5.0 of Application Resource Center (ARC) Operating Policy and Procedure No. 3.02, "Hotline Logging," Revision 0, dated June 1, 1981, an ARC analyst failed to establish a hotline log and make an entry regarding a customer-reported, major problem in the nuclear safety-related computer program PIPESD.

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Initial Management Meeting - A meeting was conducted with the management of CDC to acquaint them with the Licensee Contractor Vendor Inspection Program (LCVIP), the NRC organization relative to the Vendor Program Branch, and the type of documents generated and processed in implementing the LCVIP.

2. QA Program Evaluation - The COMSOURCE/CYBERNET QA Manual and implementing procedures governing the areas of QA Program, organization, corrective action, product release, error reporting, QA record retention, internal and external audits, vendor QA requirements, training, management reviews, and document control were reviewed to determine that they were consistent with quality and technical commitments to codes, standards, regulations, and guides. The records maintained on the safety-related computer programs PIPESD, PIPERUP, and BASEPLATE were examined for program implementation.

   CDC offers both technical and nontechnical computer programs (product applications) to their customers through a contract for access to the CDC telecomputing system CYBERNET. The technical computer programs available on the network are classified, by CDC, as safety-related (SR)

or nonsafety-related (NSR). Those programs classified SR must meet all of the requirements of the CDC QA Program plus any additional requirements imposed by their customers. Those programs classified NSR must meet some, but not all, QA Program requirements.

The CDC classification of SR means: (1) a customer contract imposed the requirements of 10 CFR Part 50, Appendix B; and/or ANSI N45.2 and applicable daughter standards; or (2) it is a CDC-developed program or one obtained from the public domain (e.g., RELAP 4, RELAP 5, etc.) for use in nuclear safety-related applications. These SR programs must meet all the requirements of the CDC QA program. In addition, the CDC suppliers of SR programs must establish and implement a QA program that meets the requirements of 10 CFR Part 50, Appendix B; ANSI N45.2 and applicable daughter standards. The programs classified as NSR do not have to meet all QA program requirements; i.e., they do not undergo verification testing, QA records (ANSI N45.2.9) are not maintained, nor are QA program requirements imposed on the supplier. In this case, it is the responsibility of the user to perform these activities prior to using the program in a safety-related analysis.

At present, there are 24 programs accessible on CYBERNET that are classified as SR (e.g., PIPESD, PIPERUP, BASEPLATE-II, NUPIPE, ADLPIPE, GTSTRUDL, STARDYNE, etc.). Seventeen of these SR programs were obtained from CDC vendors who consider them as proprietary, therefore, CDC has possession of the program in object code (machine language) form only and the applicable user manual.

The nonconformance documented in paragraph B above was identified in this area of the inspection.

3. Error in the Computer Program PIPESD - This item concerns a 10 CFR Part 21 report by CDC to the NRC's Office of Inspection and Enforcement (I&E) regarding an error in the computer program PIPESD that may have been used by CDC customers for piping stress analysis of safety-related systems. The error involves the method of modeling an elastic spring support which involves the input of several parameters, including grid point number, type, spring stiffness, and choice of global or inclined support direction. If the analyst specifies one or more global and one or more inclined supports, or two or more inclined supports on the same support grid point number, the program may incorrectly calculate the support reactions. Reportedly, the results from time history load cases and response spectrum cases are unaffected. The program vendor, URS/John A. Blume and Associates, has identified a

method of circumventing the problem by modeling each support individually on separate grid points such that the distance between the points is one-half inch or less rather than defining an inclined support in combination with a global or another inclined support at the same grid point.

The NRC inspector examined the records of program activities maintained by ARC consisting of the PIPESD application notebook, software problem report, user information manual, and the computer printout EXPLAIN.

Since this program is considered proprietary by the vendor, there was insufficient information available at CDC for the NRC inspector to determine the cause and extent of the error. These items will be evaluated during a future inspection at the program vendor's facility.

4. Error in the Computer Program PIPERUP - This item concerns a 10 CFR Part 21 report by CDC to I&E regarding an error in the computer program PIPERUP that may have been used by CDC customers to perform nonlinear analyses for SR piping systems subjected to postulated ruptures. The error reported was that arrays were not internally initialized resulting in the possibility of starting program execution with nonzero values in its memory, which would produce erroneous results.

   The NRC inspector examined the records of program activities maintained by ARC consisting of the PIPERUP application notebook, software problem report, computer printout EXPLAIN, and the user information manual.

   Further investigations of this problem by CDC disclosed that erroneous results occur only when multiple analyses are executed in the same PIPERUP job stream. These errors were found during execution of CDC independent verification problems when an analyst attempted to run the entire PIPERUP verification problem set in the same job. The problem may occur when other programs have been executed prior to PIPERUP since data files remaining from prior executions could be used by PIPERUP and produce erroneous results. The problem appears to be caused by the program vendor's (Quadrex Corporation) omission of the necessary control cards to rewind disc files after each analysis. Since PIPERUP is one of about seven programs that make up the program NUPIPE, it is probable that this condition also exists in NUPIPE.

ORGANIZATION: CONTROL DATA CORPORATION
MINNEAPOLIS, MINNESOTA

REPORT NO.: 99900532/82-01	INSPECTION RESULTS:	PAGE 5 of 5

Since this program is considered proprietary by the program vendor, there was insufficient information available at CDC for the NRC inspector to determine the cause and extent of the error. This will be evaluated during a future inspection at the vendor's facility.

There were no nonconformances or unresolved items identified in this area of the inspection.

5. Error in the Computer Program BASEPLATE - This item concerns a 10 CFR Part 50.55(e) report that the licensees, Tennessee Valley Authority and Detroit Edison, submitted to Regions II and III. CDC had notified the licensees of two conditions that will cause erroneous results. The first occurs when a negative angle (X and Y) is input for attachments in a rotated configuration. The second occurs when using the post-processing option with multiple-load cases. This condition only produces erroneous results when the number of elements in the baseplate model, times the number of load cases, exceeds 900.

The NRC inspector examined the records of program activities maintained by ARC consisting of the BASEPLATE application notebook, software problem report, user manual, hotline call record, and computer output EXPLAIN.

The examination of ARC records and discussions with CDC representatives disclosed that BASEPLATE was developed in the CDC eastern region and installed on the SCOPE 3.4 operating system only on June 29, 1981. The errors were detected during testing of the program for release to CDC's operating system (NOS 175/176). Version 2.0 of the program, released on November 2, 1981, corrected the version 1.0 problems, and is the only official version; however, a number of unofficial and unchecked versions may still exist. CDC has notified their customers of the errors and status of version 1.0. The cause of the errors could not be determined since ARC did not have the records covering the development of version 1.0. This item will be examined further during a future inspection.

There were no nonconformances or unresolved items identified in this area of the inspection.

ORGANIZATION: CROSBY VALVE & GAGE COMPANY
WRENTHAM, MASSACHUSETTS

REPORT NO.: 99900052/82-01	INSPECTION DATE(S) 3/8-12/82	INSPECTION ON-SITE HOURS: 32

CORRESPONDENCE ADDRESS: Crosby Valve & Gage Company
ATTN: Mr. R. Teplow
President
43 Kendrick St.
Wrentham, MA 02093

ORGANIZATIONAL CONTACT: J. J. Greene, Quality Assurance Manager
TELEPHONE NUMBER: (617) 384-3121

PRINCIPAL PRODUCT: Nuclear Safety and Relief Valves.

NUCLEAR INDUSTRY ACTIVITY: Crosby Valve & Gage Company's (CVGC) contribution to the nuclear industry represents approximately 40 percent of its total work.

ASSIGNED INSPECTOR: J Bacon 5-4-82
for W. D. Kelley, Reactive & Component Program Section (R&CPS) Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes 5-4-82
I. Barnes, Chief, R&CPS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21 and 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made as a result of the issuance of a 10 CFR Part 21 report by the General Electric Company, Nuclear Power Systems Division, concerning the failure of a Crosby Valve & Gage Company (CV&GC) safety relief valve to demonstrate compliance with IEEE-323-1974 environmental qualification test requirements. These valves have been manufactured for the following plants: (1) Tennessee Valley Authority-Hartsville Nuclear Plant, Units 1 and 4, and (Cont. on next page)

PLANT SITE APPLICABILITY:

50-518, 50-519, 50-520; 50-521, 50-553, 50-554, 50-358, 50-373, 50-374; 50-387, 50-397.

ORGANIZATION: CROSBY VALVE & GAGE COMPANY
WRENTHAM, MASSACHUSETTS

REPORT NO.: 99900052/82-01	INSPECTION RESULTS:	PAGE 2 of 6

SCOPE: (Cont.) Phipps Bend Nuclear Plant, Units 1 and 2; (2) Cincinnati Gas & Electric Company-William H. Zimmer Nuclear Station, Unit 1; (3) Commonwealth Edison Company-LaSalle County Station, Units 1 and 2; (4) Pennsylvania Power & Light Company-Susquehanna Steam Electric Station, Unit 1; and (5) Washington Public Power Supply System-Nuclear Project, 2. Additional areas selected for inspection included nonconformances and corrective action, and status of previous inspection findings.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Deviation (80-01): Deficiencies were identified on the Suppliers Qualification Survey Forms and no corrective action was required.

   The NRC inspector verified that Departmental Operating Instruction QA-48-3004, Revision 2 which requires the auditor to either implement a Corrective Action Request, or enter an explanation as to why the vendor was not required to meet a requirement when "No" is checked on the Supplier Qualification Survey Form (QC-56).

2. (Closed) Unresolved Item (82-01): Four of the threaded stud holes appeared to have reduced ligaments on body Serial Number N-90490-55-0114.

   CV&GC Test Report No. 3854, "Investigation of Minimum Ligament Size on the Outside Diameter of Tapped and Studded Flanges," was reviewed, and it was verified that CV&GC drawing No. GS-4 Sheet 1 of 2, Revision AA, specified the "minimum edge distance" of drilled and tapped holes from the outside diameter of the valve body.

E. OTHER FINDINGS OR COMMENTS:

1. 10 CFR Part 21 Report by General Electric Company, Nuclear Power Systems Division (GE-NPSD) - Safety relief valves failed to comply with IEEE-323-1974 environmental qualification test requirements.

a. Background

GE-NPSD notified the NRC on August 12, 1981, that an evaluation by Wylie Laboratories (WL) for Commonwealth Edison Company of the environmental test performed on a CV&GC actuator with a solenoid that contained parts obtained from Peter-Paul Electronics Company, Inc., (PPECI) revealed that 130 VDC was needed to actuate the solenoid during a simulated 340° F, 105 psig steam LOCA condition. The minimum voltage to actuate the solenoids under the worst case condition is 105 VDC.

b. Findings

(1) Style HB Size 6R10 Safety/Relief Valves

Paragraph 4.2.8 of the GE Design Specification No. 21A9247, Revision 0, dated February 6, 1970, specifies that the style HB size 6R10 safety/relief valves be equipped with pneumatic operators and three way packless solenoid valves. GE revised their design specification on January 8, 1971, to add paragraph 4.2.8.3.4 which states, "The solenoid valve shall be furnished per suppliers catalog number listed on the purchased part drawing, or equal, as approved by the buyer following qualification testing to verify performance during exposure to ambient conditions noted herein." On September 21, 1973, CV&GC returned the signed acknowledgement copies of Purchase Orders No. 205-AD143, Revision 8, and 205-AD149, Revision 9, to GE. GE issued an Engineering Data Sheet on January 1, 1975, which states in part, "The design of the Automatic Valve Company Model C-5246 solenoid operated air valve has been qualified to survive exposure to five year radiation dose (at 75R/hr) and emergency ambient conditions of 96 hours when: (1) seals are made of Viton; (2) critical dimensions of valve internals are within design tolerances."

ORGANIZATION: CROSBY VALVE & GAGE COMPANY
WRENTHAM, MASSACHUSETTS

REPORT NO.: 99900052/82-01	INSPECTION RESULTS:	PAGE 4 of 6

Automatic Valve Company (AVC) solenoid valves were installed on the CV&GC Style HB 6R10 safety/relief valves shipped to the following nuclear plants: (1) Cincinnati Gas & Electric Company-William H. Zimmer Nuclear Station, Unit 1; (2) Commonwealth Edison Company (CEC)-LaSalle County Station, Units 1 and 2; (3) Pennsylvania Power & Light Company-Susquehanna Steam Electric Station, Unit 1; and (4) Washington Public Power Supply System-Nuclear Project Unit 2.

GE issued a purchase order to CV&GC to upgrade the performace of the Type 6R10 safety/relief valve actuators. The NRC inspector could not ascertain from the documents and correspondence at CV&GC why GE found it necessary to upgrade the actuators by replacing the AVC solenoid valves with the CV&GC Model 1MF-2 solenoid valves.

CEC-LaSalle County Station, Unit 1, safety/relief are presently being retrofitted with the new CV&GC solenoid pilot valves (Model IMF-2).

(2) Style HB Size 8R10 Safety/Relief Valves

CV&GC acknowledged GE purchase orders No. 205-AH021, Revision 2, No. 205-AH026, Revision 2, and No. 205-AH027, Revision 2 for Style HB Size 8R10 safety/relief valves by letter dated November 7, 1977. The safety/relief valves were to be equipped with valve pneumatically operated actuators in accordance with GE specification 21A3530. Paragraph 4.2.2.2 of the specification states, "Unless otherwise stated, DC voltage will be a nominal 125 volts with an allowable variation of 84 to 104 percent of nominal . . . ." Also, paragraph 4.6 of the specification required a qualification test to be performed in accordance with a GE approved written procedure.

CV&GC designed the solenoid valve for the safety/relief valve actuator using parts obtained from PPECI. The environmental qualification test on the actuator was performed by WL under contract to GE.

ORGANIZATION: CROSBY VALVE & GAGE COMPANY
WRENTHAM, MASSACHUSETTS

REPORT NO.: 99900052/82-01	INSPECTION RESULTS:	PAGE 5 of 6

Paragraph 3.0 "Results" of the Section XIV, of the WL report dated November 5, 1979, states in part " . . . Solenoid No. 1 was energized with 106 VDC but no actuation occurred. At the request of General Electric Engineering, the solenoid voltage was increased in 5-volt increments until an actuation occurred (reference Notice of Anomaly No. 15)." WL Notice of Anomaly No. 15 states in the description, "Upon reaching 340°F, 105 psig and maintaining 340°F for 10 minutes, an attempt was made to actuate the valve actuator at 106VDC and 90 psig above chamber pressure, no actuation occurred on Solenoid No. 1 or Solenoid No. 2. The solenoid voltage was increased to approximately 120 VDC and the solenoid actuated. The resistance of the coils had increased approximately 500 ohms each. The test was shutdown and GE Engineering was notified . . . At the request of GE Engineering, the test was reestablished at 120° F, 0 psig then ramped to 340° F, 105 psig with air to the solenoid inlet of 90 psig above the chamber ambient pressure, and the solenoid deenergized. After reaching 340° F and maintaining for 10 minutes, Solenoid No. 1 is to be actuated with 106 VDC. If no actuation occurs, the solenoid voltage is to be increased in 5-volt increments until actuation occurs or 138 VDC is reached . . . . The solenoid actuated at 130 VDC. The first 340° F transient and 6 actuations were completed."

GE notified CV&GC by TWX dated November 19, 1979, that, "Wylie has informed General Electric this date that subject design has successfully completed environmental qualification testing (LOCA)." The basis for issue of the TWX by GE in light of the WL test results above could not be established at CV&GC during this inspection.

Solenoid valves with PPECI parts installed on the CV&GC Style HB Size 8R10 safety/relief valves were shipped to TVA-Hartsville Nuclear Plant, Units 1 and 2, in June 1981.

(3) Modification of Style HB Sizes 6R10 and 8R10 Safety Relief Valves

GE issued their Purchase Orders No. 205-AJ986, Revision 0, and No. 205-AJ985, Revision 0, dated April 24, 1979, to CV&GC to provide the material and services necessary to modify, test, and deliver their Type 6R10 and 8R10 main steam

ORGANIZATION: CROSBY VALVE & GAGE COMPANY
WRENTHAM, MASSACHUSETTS

REPORT NO.: 99900052/82-01	INSPECTION RESULTS:	PAGE 6 of 6

safety/relief valves in accordance with the requirements of GE specification 22A6641. Paragraph 1.2 of the scope states, "This specification shall be used to upgrade the performance of the above noted SRV's to the requirements of this specification." CV&GC will install their solenoid valve (Model MF-2) on all GE-purchased safety/relief valve requiring modification.

(4) Notification of Reportability

CV&GC evaluated the solenoid problem and has taken the position that the safety/relief valves with the pneumatic operator meet the GE specifications and, therefore, if a reportable condition exists, it was GE's responsibility to notify NRC.

GE notified CV&GC on August 19, 1981, that the safety/relief valve solenoid problem had been judged to be a reportable condition, and NRC had been notified by letter dated August 12, 1981.

2. Nonconformances and Corrective Action

Reviewed three sections of the Quality Assurance Manual, corrective action requests generated from January 1, 1978 to present, Reject Tags and Defective Stock Reports for parts located in the Discrepant Material Hold Area, and Material Project Notices. Verified the procedures had been implemented to identify and document nonconformances and documented corrective action.

ORGANIZATION: EBASCO SERVICES, INC.
NEW YORK, NEW YORK

REPORT NO.: 99900505/82-02	INSPECTION DATE(S) 4/26-30/82	INSPECTION ON-SITE HOURS: 35

CORRESPONDENCE ADDRESS: Ebasco Services, Inc.
ATTN: Mr. B. E. Tenzer, Vice President
Materials Engineering and Quality Assurance
Two World Trade Center
New York, NY 10048

ORGANIZATIONAL CONTACT: B. R. Mazo, Chief Quality Assurance Engineer
TELEPHONE NUMBER: (212) 839-2830

PRINCIPAL PRODUCT: Architect Engineering Services

NUCLEAR INDUSTRY ACTIVITY: The total effort committed to domestic nuclear activities is approximately 50% of a 5,000 person staff. Major projects include Shearon Harris, Units 1 through 4; St. Lucie, Unit 2; Waterford, Unit 3; WPPSS, Unit 3; and Allens Creek, Unit 1. The are also modification/ repair/service contracts on 10 additional reactor units.

ASSIGNED INSPECTOR: D F Fox
D. F. Fox, Reactor Systems Section (RSS) 6/17/82 Date

OTHER INSPECTOR(S):

APPROVED BY: C J Hale
C. J. Hale, Chief, RSS 6/21/82 Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B, and Topical Report No. ETR-1001.

B. SCOPE: This inspection was made as a result of a Louisiana Power and Light 10 CFR Part 50.55(e) report that valves in the suction lines to the low pressure safety injection pumps for Waterford Unit 3 were not procured to withstand the high differential pressure to which they would be subjected during the shutdown cooling mode of operation; and a special design inspection
(Cont. on next page)

PLANT SITE APPLICABILITY:

Waterford Unit 3, Docket No. 50-382 and WPPSS Unit 3, Docket No. 50-508.

ORGANIZATION: EBASCO SERVICES, INC.
NEW YORK, NEW YORK

REPORT NO.: 99900505/82-02	INSPECTION RESULTS:	PAGE 2 of 5

SCOPE: (Cont.)

of the WPPSS Unit 3 safe shutdown capability in the event of a postulated rupture of any high or moderate energy fluid system line outside of the reactor containment.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

Contrary to Criterion V of Appendix B of 10 CFR Part 50 and Section 5.3.1 of the Waterford No. 3 Project Procedure E-11, the control of as-built drawing revisions was not handled by the Waterford No. 3 Drawing Closeout Schedule as evidenced by the fact that the March 31, 1982, issue of the schedule did not show Design Change Notification DCN-MP-589 as outstanding against design drawing LOU-1564-G-195.

C. UNRESOLVED ITEM:

Certain safe shutdown analyses may not meet regulatory requirements in that they do not appear to be sufficiently detailed with respect to design assumptions, bases, source of inputs, reference to plant physical arrangement drawings, analytical models, change control, and interpretation of results. This item will be further evaluated during a future inspection.

D. OTHER FINDINGS OR COMMENTS:

1. Design Inspection - Branch technical position papers, sections of the WNP-3 PSAR and FSAR, and applicable design control procedures were reviewed to determine the commitments, design bases, and design measures employed by Ebasco to assure that the WNP-3 nuclear power station can be safely shut down in the event of a rupture of any high energy or moderate energy fluid system line outside of the reactor containment.

Drawings, instructions, calculations, specifications, reports, letters and memoranda, and other documentation related to the direct effects (pipe whip, jet impingment, etc.) and indirect effects (compartment temperature, pressure, humidity, etc.) resulting from postulated pipe ruptures were examined to verify implementation of commitments.

The Ebasco pipe whip and jet impingment studies do not appear to be congruent with current NRC guidance, and certain safe shutdown analyses may not meet regulatory requirements. (See Unresolved Item, paragraph C above.) Further, the NRC inspector did not examine sufficient documentation to determine that compartment temperature and pressure transients, resulting from postulated piping ruptures, were properly calculated, and that the compartment design allowable values were not exceeded.

Ebasco management stated that a formal design review of these analyses would be conducted and the results made available for examination during a subsequent NRC inspection of this item.

2. 10 CFR Part 50.55(e) Report Inspection - Review of safety injection and residual heat removal system flow diagrams, equipment specifications, and interviews with cognizant personnel indicate that as a result of a 1973 vintage design error, 20-inch butterfly type valves in the suction lines to the low pressure safety injection (LPSI) pumps for Waterford Unit 3 were not procured to withstand the high differential pressure to which they would be subjected during the shutdown cooling system (SDCS) mode of operation. The valves were ordered from Fisher Controls Company to Ebasco specification LOU-1564-109A via Ebasco purchase order NY-403483, dated April 10, 1974, and released by Ebasco QA for delivery to the site on February 22, 1980.

   The subject valves are required to be locked open during normal plant operations. In order to put the SDCS in service, at around 370 PSIG system pressure, as required by Combustion Engineering operating instructions, the valves must be closed and be capable of withstanding 415 PSIA system pressure with only a few PSI acting on the other side of the valve.

ORGANIZATION: EBASCO SERVICES, INC.
NEW YORK, NEW YORK

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The valve manufacturer stated in a letter to Ebasco, dated March 5, 1982, "Fisher Controls does not offer equipment, in this size range, which will accommodate the Ebasco specified 415 psi shutoff Delta P at a 400° F operating temperature . . . The end result of operating at these services would be substantial leakage through the T-ring seal with possible seal damage and loss of the seal itself."

When either LPSI pump is lined up for SDCS, the associated closed butterfly valve becomes part of the primary coolant system pressure boundary, and in conjunction with its associated check valve, must serve to meet the ASME code requirement for double isolation of lines connecting to the primary coolant system.

Failure of either of the butterfly valves would allow only single valve isolation of primary coolant during the SDCS mode. Subsequent failure of the associated check valve subjects the balance of the safety injection system piping to conditions beyond its design rating. This condition was considered by Ebasco to be unacceptable and to be reportable to NRC under 10 CFR Part 50.55(e). Ebasco revised the design of the piping system to include a second in-line check valve between each existing butterfly valve and its associated existing check valve.

One nonconformance was identified in this area of the inspection in that the design change notice (DCN) initiated by Ebasco engineering, to revise the design of the associated piping systems, was not posted against the safety injection system piping drawing. (See B above.) In addition to correcting this item, Ebasco management stated that they would revise the butterfly valve specification to reflect the as-built condition of the valves.

The NRC inspector noted that: (1) Ebasco engineering apparently based their safety injection system flow diagram on the Combustion Engineering flow diagram which similarly used the butterfly valve and a single check valve to provide the double isolation required by the Code in the SDCS model; (2) Ebasco engineering apparently did not note that the Fisher Controls "Butterfly Valve Selection Guide" stated that the maximum design pressure drop for this specific type of T-ring butterfly valves was

ORGANIZATION: EBASCO SERVICES, INC.
NEW YORK, NEW YORK

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360 psi, not 415 psi as required; (3) neither QA nor engineering required testing of valves to assure that the valves met the Ebasco specified "Maximum Allowable Shutoff Pressure of 415 psig"; (4) neither QA nor engineering noted that Fisher Controls lined out the "Disk Differential Test Pressure _____ psi," data entry on their letter/certificate of compliance and N Certificate Holders Data Report for Nuclear Pumps or Valves; and (5) the Ebasco vendor quality assurance representative signed the VQAR form and release for shipment form which states that "Evidence supporting this release has been reviewed . . . and the manufacturer . . . has certified that the above described material (the butterfly valves) meets all requirements of the specifications," when in fact the valves did not meet the Ebasco specified maximum allowable shutoff pressure of 415 psig.

With respect to the identified nonconformance, Ebasco management completed or committed, corrective action and preventive measures with respect to the nonconformance in that:

(1) DCN-MP-589 would be shown as outstanding against design drawing LOU-1564-G-195,

(2) A special audit was performed by Ebasco quality assurance personnel to evaluate the extent of the identified deficiency. The audit disclosed similar problems on other design drawings examined,

(3) Quality assurance stated that they would audit Drawing Closeout schedules bimonthly until the error rate was reduced to statistical insignificance.

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SAN JOSE MOTOR PLANT
SAN JOSE, CALIFORNIA

REPORT NO: 99900339/82-01	INSPECTION DATE(S) 6/28-7/2/82	INSPECTION ON-SITE HOURS: 26

CORRESPONDENCE ADDRESS: General Electric Company
San Jose Motor Plant
ATTN: Mr. R. W. Hagstrom
Manager, Quality Assurance
P. O. Box 6376, Mail Code 970
San Jose, CA 95150

ORGANIZATION CONTACT: Mr. R. W. Hagstrom, Manager, QA
TELEPHONE NUMBER: (408) 925-2832

PRINCIPAL PRODUCT: AC Motors for Vertical Pumps

NUCLEAR INDUSTRY ACTIVITY: Approximately 10%

ASSIGNED INSPECTOR: R. E. Oller — 8-10-82
R. E. Oller, Reactive & Components Program Section, (R&CPS) — Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes — 8-10-82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and 10 CFR Part 21.

B. SCOPE: Status of previous inspection findings, manufacturing process control, internal audits, nonconformances and corrective action, and 10 CFR Part 21.

PLANT SITE APPLICABILITY:

Salem, Docket No. 50-311; Enrico Fermi No. 2, Docket No. 50-341; A. W. Vogtle, Docket No. 50-427.

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A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Deviation A (79-01): Failure to recalibrate certain measuring devices and test instruments within the specified calibration schedule as required by Section XII of the QA Manual.

   The inspector verified that, in accordance with the vendor's response letter, dated July 2, 1979, all of the inspection and test devices in the plant were located, checked, and recalibrated; and the results recorded on the calibration record cards. Record entries showed that these devices were currently recalibrated within the specified schedule.

2. (Closed) Deviation B (79-01): Failure to include certain measuring devices and test instruments in the calibration recall card system.

   The inspector verified that in accordance with the vendor's response letter, dated July 2, 1979, a thorough investigation was made of all the inspection devices in the plant and those which were not identified in the recall system were added to the Gage Lab recall calibration card system. Record entries showed that these devices were entered on the recall cards.

E. OTHER FINDINGS OR COMMENTS:

1. Manufacturing Process Control - The inspector reviewed 10 sections of the vendor's QA Manual, Revision 9, which were applicable to parts manufacture, inspection, tests, and assembly of AC electric motors for vertical pumps for nuclear service.

   Observations were made of inprocess fabrication and inspection of motor components in the areas of: shaft machining, rotor casting and machining, large wound stators, formed wound coil assemblies, formed coil and random stators-rotors "VIP Treatment," and final assembly.

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To verify that motor components and motors are fabricated, inspected, tested and assembled, and the results documented in accordance with requirements, a review was made of: seven quality control requirement (QCR) procedures; five different types of inspection records in the shaft inspection area; four different inspection records in the large wound stator area; three different inspection records in the formed wound coil assembly area; two different inspection records in the rotor area; a GE Requisition No. 30362115 and four related inspection records for components of motors for the Salem Nuclear Plant; a GE Requisition No. 320-69585 and nine inspection records for components and motors for the Enrico Fermi Plant No. 2; and six inspection records for components of motors for the A. W. Vogtle Nuclear Plant.

Within this area, no nonconformances or unresolved items, with respect to NRC and the QA program requirements, were identified.

2. Internal Audits - The inspector reviewed Section XVIII "Audits" of the vendor's QA manual to verify that: (a) planned periodic audits of all aspects of the QA program are performed in accordance with written procedures or checklists by qualified personnel; (b) the results are documented and reviewed by management; and (c) followup action is taken where indicated. A review was made of two QCR procedures, 18 checklist audit records of the QA program areas audited on November 5, 1981, and current training and certification records for 15 auditors.

   Within this area, no nonconformances or unresolved items, with respect to NRC and the QA program requirements, were identified.

3. Nonconformances and Corrective Action - The inspector reviewed Section XV, "Non-Conforming Materials, Parts, and Components," and Section XVI, "Corrective Action," of the vendor's QA manual. To verify that nonconforming items are reviewed and accepted, rejected, repaired or reworked, and that conditions adverse to quality, including the cause, are promptly identified and corrected, a review was made of: two QCR procedures; four weekly product rejection data sheets; 20 inspector's reports on rejects; 20 corrective action request reports; a corrective action record summary, and corrective action record log sheets.

   Observations were made of facilities for segregation of nonconforming items in four departments.

   Within this area, no nonconformances or unresolved items, with respect to the NRC and QA program requirements, were identified.

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4. 10 CFR Part 21 - The inspector reviewed the vendor's document No. SJMP-1G-54, "Complying with Regulation Reporting Of Defects And Non-Compliance," to verify that adequate documented measures are available to meet the reporting requirements of 10 CFR Part 21.

   A notice to employees, which meets the posting requirements of 10 CFR Part 21, was observed to be posted on the employee bulletin board.

   Within this area, no violations to 10 CFR Part 21, were identified.

ORGANIZATION: GENERAL ELECTRIC COMPANY
NUCLEAR ENERGY BUSINESS OPERATIONS
SAN JOSE, CALIFORNIA

REPORT NO: 99900403/82-02	INSPECTION DATE(S) 6/7-11/82	INSPECTION ON-SITE HOURS: 35

CORRESPONDENCE ADDRESS: General Electric Company
Nuclear Energy Business Operations
ATTN: W. H. Bruggeman, Vice President and General Manager
175 Curtner Avenue
San Jose, California 95125

ORGANIZATION CONTACT: Mr. A. Breed, Manager, Quality Assurance
TELEPHONE NUMBER: (408) 925-2726

PRINCIPAL PRODUCT: Nuclear Steam System Supplier

NUCLEAR INDUSTRY ACTIVITY: General Electric Company, Nuclear Energy Business Operations (NEBO), has a work force of approximately 7650 people with approximately 98% of that work force devoted to domestic nuclear activity. NEBO currently has 26 reactor units under construction and 4 reactor units under contract. NEBO also has approximately 115 service contracts with various clients.

ASSIGNED INSPECTOR: Dwight D. Chamberlain 7-23-82
D. D. Chamberlain, Reactor Systems Section (RSS) Date

OTHER INSPECTOR(S): P. H. Harrell, RSS

APPROVED BY: C. J. Hale 7/23/82
C. J. Hale, Chief, RSS Date

INSPECTION BASES AND SCOPE:

A. BASES: General Electric Topical Report No. NEDO-11209-04A and 10 CFR Part 50, Appendix B.

B. SCOPE: Status of previous inspection findings and follow up on the following items: (Cont. next page.)

PLANT SITE APPLICABILITY: Docket Numbers 50-522/523, 50-278, 50-333, 50-373/374 50-410, 50-416/417, 50-440/441, 50-458/459, 50-461, 50-466/467, 50-518 and 50-556/557.

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B. SCOPE: (Cont.)

1. 10 CFR Part 50.55(e) report (River Bend project) stating that the heat loads provided by GE to Stone & Webster (S&W) for sizing the heating and ventilating (HVAC) system in the high pressure coolant injection (HPCI) system diesel generator room were about 1/3 of the expected value.

2. Mississippi Power & Light (Grand Gulf project) reported that the fuel pool cooling and cleanup heat exchanger relief valve settings were 10% above design pressure.

3. 10 CFR Part 21 report (Grand Gulf project) stating that reactor pressure vessel water level transmitters and trip units could not be adjusted to the specified setting.

4. 10 CFR Part 21 report (Hartsville project) stating that the orifice diameter for the Residual Heat Removal discharge line was incorrectly specified as 0.63" rather than the required 6.31".

5. GE notification to operating BWR plants that the HPCI or RCIC high steam flow trip differential pressure setting must be determined by actual test results.

6. Report of GE error in computing four bundle power allocation factors (Peach Bottom project).

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A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Section 5 of Topical Report No. NEDO-11209-04A and Sections 1.1 and 4.3.b.5 of EOP 45-4.00, a supplier submitted drawing for the Fuel Pool Heat Exchangers (Grand Gulf project) was reviewed and approved by GE even though the setpoints for the heat exchanger relief valves were specified to be set at a pressure 10% above the design pressure. The purchase order that included these valves invokes ASME code, Section III, 1974 Edition, Winter Addenda requirements which state that the set pressure of pressure relief devices shall not be greater than the design pressure of the protected system.

2. Contrary to Section 5 of Topical Report No. NEDO-11209-04A and Appendix B of NEBGP 70-42, a GE 10 CFR Part 21 report relating to a defect in selection of instrument range for reactor vessel water level transmitters and trip units submitted on August 19, 1981, did not include all required information.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Nonconformance (82-01): Requested additional information for a potentially reportable condition was not provided within 5 working days.

   GE stated that the additional information was transmitted orally and the required action is now complete. A memo was issued to emphasize the need for the Safety Evaluation Programs unit to continue to expedite the responses within the specified time frame and to document the communications in the 10 CFR Part 21 record files.

2. (Closed) Nonconformance (82-01): No Engineering Review Memo (ERM) existed to document the engineering review of operating and maintenance manual GEK 75662A for the High Pressure Core Spray System (Clinton Project).

The missing ERM (preliminary manual issue) was located after the inspection and to preclude misplacing ERM's in the future, the ERM will be processed through the document release and control function at the time of manual issue and a permanent microfilm record will be made and retained. A thorough review was made by GE of all operating and maintenance manual-related ERM's since implementation of the ERM practice. All required ERM's have been located.

E. OTHER FINDINGS OR COMMENTS:

1. HVAC Heat Load Sizing for the High Pressure Coolant System (River Bend) - This area of inspection resulted from a 10 CFR Part 50.55(e) report from the River Bend project stating that the heat loads provided to S&W by GE for the sizing of HVAC in the HPCS diesel generator room were about 1/3 the actual values. An S&W engineer apparently questioned the values of heat radiation provided. One supplier (Morrison Knudsen) of HPCS diesel generators to GE has performed tests on one unit for verification of actual heat radiation values. GE is presently evaluating the results of these tests and it appears that the test values are higher (2-3 times) than the originally stated values. This item will remain open at GE for completion of the following:

   a. GE to obtain revised heat load values.

   b. GE to notify affected projects.

   c. GE to revise affected documents.

   GE stated that the following sites could be affected: La Salle, Nine Mile Point 2; Perry; Clinton; River Bend; Hanford; Grand Gulf; Allens Creek; TVA (all); Skagit; and Black Fox.

2. Incorrect Relief Valve Settings (Grand Gulf project) - The Grand Gulf licensee (Mississippi Power and Light) reported that incorrect relief valve pressure settings for the Fuel Pool Heat Exchangers had been provided by GE on a drawing. The relief valves should be set at system design pressure (250 psig for the shell side and 150 psig for the tube side) as required by the ASME Code, Section III, 1974 Edition. The values supplied on the drawing stated the setpoints to be 275 psig for the shell side and 165 psig for the tube side (10% above the system design pressure). The purpose of this inspection at GE was to determine if a design verification was performed and who provided the incorrect set point values.

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After a review of GE documents and discussions with GE personnel, the NRC inspector found the following:

a. The relief valves were supplied by a supplier to GE (Atlas Industrial Manufacturing Co.) and the setpoints were specified on the supplier drawing. This drawing was part of the supplier information provided with the heat exchanger.

b. The responsible GE engineer reviewed and approved the vendor drawing that specified the incorrect relief valves settings.

Based on the above, a nonconformance (B.1 above) was identified.

Prior to completion of this inspection, GE reviewed all other heat exchanger orders and reported by memo (dated June 10, 1982) that all other heat exchanger orders had been reviewed and no other cases of this type were identified. Also, discussions had been held with engineering personnel to assure the requirements of the ASME code for relief valve setpoints are clearly understood. GE stated that the licensee is correcting the problem at Grand Gulf. Since corrective and preventive actions have been taken by GE, no further written response to the nonconformance is necessary. The NRC inspector will make a spot check of other heat exchanger orders during a future inspection.

3. Incorrect Range for Water Level Transmitters (Grand Gulf project) - This area of inspection resulted from a 10 CFR Part 21 report regarding incorrect range of reactor pressure vessel (RPV) water level transmitters and trip units. This item was initially identified by GE on the Grand Gulf project. The problem was evaluated by GE and determined to be reportable under 10 CFR Part 21 since the shipped transmitters and trip units could not fulfill their intended safety function to provide RPV Level 3 and Level 8 scram signals. The affected plants include: Clinton; Perry; TVA (Hartsville); River Bend; and Grand Gulf. GE has issued Field Disposition Instructions to the affected projects for replacement of the transmitters and/or trip units. GE had initiated a program in late 1980 for a general upgrade of design specifications to include more complete information for instrument ranges, set points, accuracy, etc., and GE stated that the completion of this program should prevent recurrence of this type of problem. It appears that the initial problem was due to the design imput document (design specifications) being incomplete for proper instrument selection.

The review of the general upgrade program in process by GE indicates that the upgraded design specifications will contain the required information for proper instrument selection and for design verification. Therefore, this item is considered closed at GE.

During the review of the 10 CFR Part 21 report issued by GE on this problem, it was noted that the report did not contain all required information. A nonconformance (B.2 above) was issued relative to 10 CFR Part 21 report contents. After a telephone conference with the Region IV inspector, GE and the Events Analysis Branch of the NRC's Office of Inspection and Enforcement, it was determined that the following two commitments from GE were required (GE memo CAC 56-82, dated June 11, 1982):

a. All future GE reports will use the 10 CFR Part 21 list of requirements as the report format in order to clearly outline the information required. The information submitted will be complete, or a commitment will be made in the report to supply missing information in a followup report.

b. GE will continue to supply to the NRC offices any information they request for clarification of GE 10 CFR Part 21 reports.

Based on the above commitments, no additional written response to the nonconformance will be necessary.

4. Incorrect RHR Orifice Size (Hartsville) - A 10 CFR Part 21 report, dated March 2, 1982, filed by the Nuclear Power Systems division of GE stated that an error was found in a fabrication document released by GE to the utility (TVA). The orifice diameter for the RHR discharge line was stated as 0.63", instead of the required 6.31" diameter. The report also stated the error was discovered and corrected before the hardware was fabricated and installed in the plant (Hartsville).

A review of the specification confirmed that this particular error has been corrected. However, the supporting design documentation and calculations were not reviewed because this work was performed by a GE subcontractor (C. F. Braun) and the records were not available at GE (San Jose). A future inspection will be made at C. F. Braun or at GE (when applicable documents become available at GE) to determine the reason for the error. This item will remain open pending the results of future inspections.

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5. Nonconservative Calculation of Differential Pressure Settings (Fitzpatrick) - The licensee (Power Authority of the State of New York) reported finding incorrect high steam flow differential pressure settings on the high steam flow isolation for the high pressure coolant injection (HPCI) system. It was also noted that a similar feature exists in the reactor core isolation cooling (RCIC) system. The purpose of this inspection was to determine the method used to establish the high steam flow trip settings and to verify that GE has supplied adequate information regarding the high steam flow differential set point requirements.

   A review of the design specification for Fitzpatrick indicated that a calculated value for the setting had been supplied by GE. However, it was noted in GE-provided start up instructions that the actual number to be used in specifying the setting was to be determined by test measurements performed during plant start up. This determination is required because the value will vary from plant to plant depending on the actual physical configuration of the flow instrument connections. The method for obtaining test measurements is provided by GE in the test start up instructions. GE stated the reason the calculation is made is to determine the required range for purchase of the flow instrument.

   The inspector determined that all affected plants had been notified of the problem by GE. In addition, the NRC has issued an Information Notice (No. 82-16) to all facilities holding an operating or construction license. The inspector also performed a spot check of design specifications for other plants. During the review, the inspector found some specifications did not contain a note stating the value provided was a calculated setting. To provide additional clarity, GE agreed to review all design specifications and include the applicable note (if missing).

   During a future inspection, a spot check of design specifications will be made to ensure the note has been included.

6. Errors in Four Bundle Power Allocation Factors (Peach Bottom) - This area of inspection resulted from a Region I request for follow up on reported errors in GE-provided computer data for licensee core power calculations. GE performs computer calculations for operating plants during each refueling in order to provide coefficients for the licensee to perform process computer calculations for core power allocations. The review of this area at GE revealed that the problem was caused by a computer input format error. The GE design review/check did not identify the error.

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GE has evaluated this condition for all operating plants and although other errors were identified, an evaluation revealed that no operational problems exist. Also, GE has evaluated the calculation process and a decision has been made to develop an automated input program to preclude future problems of this nature. This item will remain open pending an indepth evaluation of the GE calculation process during a future NRC inspection.

ORGANIZATION: GIBBS & HILL, INC.
NEW YORK, NEW YORK

REPORT NO.: 99900524/82-02	INSPECTION DATE(S) 6/21-25/82	INSPECTION ON-SITE HOURS: 36

CORRESPONDENCE ADDRESS: Gibbs & Hill, Inc.
ATTN: Mr. P. P. DeRienzo, Vice President
Quality Assurance
393 Seventh Avenue
New York, New York 10011

ORGANIZATIONAL CONTACT: Mr. N. N. Keddis, QA Manager
TELEPHONE NUMBER: (212) 760-5450

PRINCIPAL PRODUCT: Architect Engineering and Consulting Services

NUCLEAR INDUSTRY ACTIVITY: The total effort committed to domestic nuclear design activities is approximately 23% of the 2,000 employees of Gibbs & Hill, Inc., at their New York facilities. Major projects include the design of Comanche Peak, Units 1 and 2; Three Mile Island, Unit 1, FSAR update; Beaver Valley, Unit 1, equipment update; and Bellefonte, Unit 1, design studies.

ASSIGNED INSPECTOR: F. Barnes for D. F. Fox, Reactor Systems Section (RSS) — Date: 8/19/82

OTHER INSPECTOR(S):

APPROVED BY: F. Barnes for C. J. Hale, Chief, RSS — Date: 8/19/82

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and Gibbs & Hill (G&H) Topical Report GIBSAR-17-A.

B. SCOPE: Inspection of computer codes and a continuation of inspection of items identified for followup during earlier inspections.

PLANT SITE APPLICABILITY: Comanche Peak Steam Electric Station, Units 1 and 2, Dockets 50-445 and 50-446; Fort Calhoun, Unit 1, Docket 50-285.

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NEW YORK, NEW YORK

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A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to the G&H Topical Report and implementing procedure EDP-10, F-736 forms "Request for Data Processing Service or Equipment" were not initiated, reviewed, approved, and distributed for the development of computer programs DLFPW and PDROP version 1, nor for the modification of PDROP, version 1 to version 2.

2. Contrary to the G&H Topical Report and implementing procedure EDP-10, the required "final check" of computer code program descriptions did not ensure that they were accurate descriptions of the official copy of the programs CONVERT, CISRS, and DLFPW in that:

   a. The independent program review by the cognizant engineer did not assure that the documentation was complete for computer program CONVERT in that the required program description did not exist; and

   b. The program descriptions for computer programs CISRS and DLFPW did not show the methods, assumptions, and equations used to model the physical system as required.

3. Contrary to the G&H Topical Report and implementing procedure EDP-10, computer program verification was not documented, acknowledged, nor maintained in a permanent file as evidenced by the nonexistence of Computer Program Verification Forms for the CRRS (No. 6025) and the CREED (No. 3037) programs, both of which are listed in the "G&H (Computer) Program Catalog "dated June 11, 1982, and included in the "List of Computer Programs Used on CPSES" dated December 17, 1981.

4. Contrary to the G&H Topical Report and committed ANSI N45.2.11-1974, procedures did not exist, and therefore, were not employed, for: (1) identifying design inputs in computer code program descriptions; (2) approving, releasing, distributing, and revising program descriptions; (3) identifying, maintaining, and retaining program descriptions,

source listings, and computer test problem input and output data with the status of a quality assurance record; (4) controlling changes to computer codes;(5) taking corrective action when a significant deficiency is detected in a computer code; and (6) making computer code experience reports available to cognizant design personnel.

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Inspection of Computer Codes - The G&H Topical Report and implementing procedures were reviewed to determine the commitments and requirements relative to the development, control, and utilization of digital computer codes developed by G&H, or supplied to G&H by a vendor, that are used in the design or analysis of safety-related structures, systems, and components.

   Requests for data processing service or equipment, program descriptions, source coding (program listings), job control cards, sample inputs to computer runs and their corresponding outputs, test problems, code validation/certification data, computer program verification forms and records, and other documentation related to the following computer codes were reviewed to verify implementation of commitments and requirements:

   a. CONVERT (No. 3910) - Extracts a finite element wall or floor, or creates a contour file, from NASTRAN (No. 3030) files;

   b. CISRS (No. 5024, version 2) generates the envelope of multiple seismic response spectra for input to ADLPIPE (No. 5017);

   c. DLFWP (No. 3213) - Calculate dynamic load factors from displacement response spectra;

   d. PDROP (No. 5002, version 1 and 2) - Calculates pressure drops resulting from fluid flow in piping systems;

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e. ENVELOP (No. 3108) - Envelops the results obtained from SCONV (No. 3075), TIME (No. 3110) and DYNRE5/STARDINE (No. 3224) programs;

f. RCFRAM (No. 3222) - Performs a reinforced concrete design for a frame-shear wall structure;

g. CRRS (No. 6025) - Routes and schedules cables for a power plant; and

h. CREED (No. 3037) - Computes environmental and control room doses from radiation sources.

The inspector noted that G&H appointed a task force in January 1982 to implement the recommendations generated by the (December) 1981 "QA Program Management Review." The purpose of the task force" is to make cperational an improved computer usage control system which will incorporate computer software and hardware security features as well as administrative procedures to assure use of only suitably verified programs." The task force reported that all CPSES programs have been, or will be, verified by May 21, 1982. The CREED Program was reported as being verified and the CRRS program was identified for verification by May 21, 1981, neither of which were verified prior to the NRC inspection. A draft revision of procedure EDP-10 was generated for review and comment. The draft proposes to implement additional administrative and software controls to provide additional assurance against unauthorized modification/use of approved and verified computer programs.

Four nonconformances were identified in this area of the inspection (see B above).

2. Followup inspection of a design change control inspection (81-03) to determine if the anomalies noted in the Design Change Authorization Master Index and nonavailability of certain Design Change Authorizations (DCAs), and Design Engineering/Change Deviations (DE/CDs).

G&H reviewed the Design Change Authorization Master Index and all issued DCAs and DE/CDs for congruency. All needed additions, deletions, and changes have been identified and appropriate corrective action taken.

3. Followup inpsection of a 10 CFR Part 21 report inspection (82-01) to determine the status of actions taken by G&H to correct design defects in the tornado venting systems for Comanche Peak Steam Electric System (CPSES), Units 1 and 2.

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G&H determined that the following design changes were required to assure that the pressure differential across interior walls, doors, glass panels, electrical equipment cabinets, etc., would not exceed design allowable during a design basis tornado (DBT). Further, additional tornado vents were added in the control room and certain contiguous equipment rooms dampers installed in certain HVAC ducts; replaced selected ceiling tiles in the control room with louvered vents; deleted doors or used open wire mesh in doors that are not needed for fire containment; and required that certain vital interior doors be equipped with latching mechanisms to maintain them in the requisite open or closed position. The needed design changes have been identified in five issued DCAs. Equipment specifications and purchase orders for the additional vents and dampers have been issued and four of the seven affected drawings have already been revised. The remaining three are scheduled for revision by the third quarter of 1982.

4. Followup inspection of a design inspection (82-01) to determine the status of actions taken by G&H to mitigate the consequences of environmental conditions exceeding design allowables in the event of a postulated rupture in certain fluid system piping outside containment.

G&H determined by analysis that certain design changes may be required to mitigate the adverse excursions in compartment temperature and pressure that could result from postulated ruptures in the residual heat removal system, the chemical volume and control system, the auxiliary steam system, the steam generator blowdown system, and the main steam to auxiliary feedwater pump system.

Preliminary studies by G&H indicate that the compartment pressures could be prevented from exceeding design allowable, and the compartment temperatures prevented from exceeding that for which the safety related equipment in the affected compartments is environmentally qualified, by installing temperature, pressure, and/or flow sensors in affected compartments and installing high speed motor operators to automatically close existing manual valves, or slow operating motor operated valves, in the event of a line break. Closing the valves within 10 to 20 seconds after the line break is detected is intended to reduce the total quantity of fluid, and thus the enthalpy, discharged from the ruptured pipe, thus reducing the maximum temperature and pressure experienced within the affected compartments.

This item will be inspected further during subsequent inspections.

ORGANIZATION: HITTMAN NUCLEAR & DEVELOPMENT COMPANY, INC.
COLUMBIA, MARYLAND

REPORT NO.: 99900768/82-01	INSPECTION DATE(S) 1/29/82 and 2/16-18/82	INSPECTION ON-SITE HOURS: 27

CORRESPONDENCE ADDRESS: Hittman Nuclear & Development Company, Inc.
ATTN: Mr. Barry Koh, Vice President and General Manager
9190 Red Branch Road
Columbia, MD 21045

ORGANIZATIONAL CONTACT: Mr. Barry Koh, Vice President and General Manager
TELEPHONE NUMBER: (301) 730-7800

PRINCIPAL PRODUCT: Transportation Services.

NUCLEAR INDUSTRY ACTIVITY: Transportation services for waste disposal.

ASSIGNED INSPECTOR: W. M. McNeill 3/24/82
W. M. McNeill, Reactive & Components Program Section (R&CPS) Date

INVESTIGATOR: R. E. Shepherd, RI

APPROVED BY: I. Barnes 3/25/82
I. Barnes, Chief, R&CPS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 71, Appendix E and 10 CFR Part 21.

B. SCOPE: This inspection was made as a result of the receipt by Region I of the Nuclear Regulatory Commission of allegations pertaining to the quality of the Hittman HN-100 (Series 1), HN-100S, and HN-200 shipping casks. In particular, the allegations related to leakage of cask lids and the impact resistance of the HN-200's impact limiter.

PLANT SITE APPLICABILITY:

Not identified.

ORGANIZATION: HITTMAN NUCLEAR & DEVELOPMENT COMPANY, INC.
COLUMBIA, MARYLAND

REPORT NO.: 99900768/82-01	INSPECTION RESULTS:	PAGE 2 of 5

A. VIOLATIONS:

1. Contrary to paragraph 21.21(a) of 10 CFR Part 21, procedures had not been adopted to provide for: (1) evaluating deviations or informing the licensee or purchaser; and (2) assuring that a director or responsible officer was informed if the supplied basic component (a) failed to comply or (b) contained a defect.

2. Contrary to paragraph 21.51(b) of 10 CFR Part 21, records were not prepared with respect to failures (in February through June 1981 testing) of Flextron Urethane 66-11 foam to meet the energy absorption characteristics described in the NRC approved Safety Analysis Report (page 71) for the HN-200 cask.

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. This inspection was performed concurrently with an investigation by the Region I Investigation and Enforcement Staff. Investigative findings are contained in Report No. 99900768/82-02.

2. Background

The Hittman casks in question, models HN-100 (series 1), HN-100S, and HN-200 are designed to carry low specific activity material, namely process solids. These casks are used by power utilities to ship wastes to burial sites. The casks can be described in general as right circular cylinders with a height of six to seven feet and diameter of five to seven feet depending on the model. The inner annulus is five to six feet deep and five to six feet in diameter. A maximum load of 11,000 to 17,000 pounds can be carried giving the casks a gross weight of 20 to 25 tons (short).

Casks, lids and bases are constructed from rolled steel plate and contain lead shielding. The lids are bolted to the casks with 24 or 30 (depending on model) one inch bolts.

The lids are sealed with ½ inch O-Rings. The HN-200 cask has two impact limiters on each end. These assemblies have eight to ten inches of urethane foam encased in steel sheet metal. P.X. Engineering fabricated the two model 100S casks and two of the HN-100 (series 1) casks. NL Industries fabricated three HN-100 (series 1) casks and Ionics fabricated the one HN-200 cask.

3. Leakage

Hittman acknowledged that from approximately 1971 to 1979 casks of these types were found at a significant frequency at sites with water in them from unaccountable sources. In October and November 1979, a number of corrective action steps were taken. A procedure was implemented which addressed the torque sequence and limits to be used in lid closure. Site personnel were trained to follow this procedure. Canvas covers over the casks were used for shipments. Guide pins which held the O-Rings in place were replaced with slightly larger diameters. Regular inspection and replacement of the O-Rings was begun on a quarterly basis. It was noted that this problem has not occurred with the HN-100 (series ?) cask which has a flat ¼ x 3/8 inch gasket and ratchet locking bolts. The leakage problem has decreased since late 1979, and the institution of the above corrective actions. This had been verified at sites by Hittman and the NRC inspector. Some changes have been made to the torquing procedure since 1979, namely use of higher torque limits and an additional torque sequence.

4. Foam

Hittman acknowledged that foam had been removed from the original impact limiter. The original impact limiter assembly did not have a sheet metal skin around it. The steel skin was made and the foam inserted into it. In order to accomplish this, the foam was trimmed to fit. The drawing, Safety Analysis Report and Certificate of Compliance were revised to reflect this modification of the impact limiter. These documents have been approved by the NRC. Hittman was not aware of any void areas under the steel skin of the impact limiter.

ORGANIZATION: HITTMAN NUCLEAR & DEVELOPMENT COMPANY, INC.
COLUMBIA, MARYLAND

REPORT NO.: 99900768/82-01	INSPECTION RESULTS:	PAGE 4 of 5

In regard to the foam's energy absorption characteristics, Hittman acknowledged that a sample of foam had failed. Hittman maintained that this test was not representative of the foam bought in 1971 for the original impact limiter. Hittman could not find during the first visit on January 28, 1982: the test data in question; records certifying the original foam; evidence that the samples tested were different from the original foam; or records of the bases for the energy absorption characteristic curve. The inspection was unannounced which limited Hittman's ability to recall records from files. Records pertaining to the above were reviewed during the February 16-18, 1982, portion of the inspection.

Hittman does not have a written procedure addressing 10 CFR Part 21. 10 CFR Part 21 is documented as part of the QA training of Hittman personnel. 10 CFR Part 21 is posted; however, procedures had not been documented for evaluation of deviations, informing the personnel officer of evaluations, informing the Commission as appropriate, transmission of Part 21 in procurement, and control of records of evaluations. This was identified as a violation (see paragraph A.1).

Hittman stated that they did perform an informal review of the foam's energy absorption characteristic problem in light of 10 CFR Part 21. However, this review was not documented. This was identified as a violation (see paragraph A.2). This testing was viewed by Hittman as informal "screening," for the purpose of establishing vendor suitability. It was noted that testing did not follow QA program requirements with respect to approval and use of written test procedures.

Testing was performed on at least five occasions. On February 26, 1981, samples of foam and other material were given to a Hittman engineering team. Shortly after, some additional samples were sent by Flextron to Hittman which were not testable because of their shape. On or about March 18, 1981, one or more samples formed in tubes were picked up at Flextron by Hittman personnel. On June 16, 1981, an engineering-purchasing team witnessed a sample prepared in a tube. After that visit, Flextron sent a sample which was not formed in a tube but in a mold. All of these foam samples were identified as Unidur Formulation 66-11 rigid urethane except for the February samples. All of these samples reportedly failed the energy absorption testing and except for the last sample; all were reportedly high in density. Records of the test results exist only for the March 18 and June 16, 1981, samples.

ORGANIZATION: HITTMAN NUCLEAR & DEVELOPMENT COMPANY, INC.
COLUMBIA, MARYLAND

REPORT NO.: 99900768/82-01	INSPECTION RESULTS:	PAGE 5 of 5

It is apparent from the above, that evidence existed indicating that the foam would not meet the energy absorption characteristics described in the Safety Analysis Report.

ORGANIZATION: ITT BARTON INSTRUMENTS
CITY OF INDUSTRY, CALIFORNIA

REPORT NO.: 99900113/82-02	INSPECTION DATE(S) 6/22-23/82	INSPECTION ON-SITE HOURS: 21

CORRESPONDENCE ADDRESS: ITT Barton Instruments
ATTN: Mr. Thomas J. Shideler
General Manager
900 South Turnbull Canyon Rd.
City of Industry, CA 91749

ORGANIZATIONAL CONTACT: Mr. G. R. Welt, Director of Quality Assurance
TELEPHONE NUMBER: (213) 961-2547

PRINCIPAL PRODUCT: Process Control Instrumentation

NUCLEAR INDUSTRY ACTIVITY: The current Nuclear Class 1E Equipment produced by ITT Barton is approximately 10% of the total annual sales.

ASSIGNED INSPECTOR: Alva L. Smith 8/20/82
Alva L. Smith, Equipment Qualification Section (EQS) Date

OTHER INSPECTOR(S): J. R. Agee, EQS
H. S. Phillips, EQS

APPROVED BY: H. S. Phillips 8-26-82
H. S. Phillips, Chief, EQS Date

INSPECTION BASES AND SCOPE:

A. BASES: Appendix B to 10 CFR Part 50.

B. SCOPE: Status of previous inspection findings; Class 1E Equipment Qualification Test Program for pressure transmitters and switches to be accomplished in accordance with IEEE 323-1974 and NUREG 0588, Revision 1.

PLANT SITE APPLICABILITY: The pressure transmitters are currently being tested for use at the Waterford Nuclear Site, Docket No. 50-382.

ORGANIZATION: ITT BARTON INSTRUMENTS
CITY OF INDUSTRY, CALIFORNIA

REPORT NO.: 99900113/82-02	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Management Meeting - The purpose, scope, nature and current status of the NRC Equipment Qualification Program were reviewed with ITT management personnel. In particular, the role of Region IV in this program was discussed in depth. The format, content, dissemination and publication of NRC inspection reports were also discussed in detail.

   ITT personnel explained their current efforts in the equipment qualification area. They discussed their current test schedule and the contractors being used to accomplish radiation aging, seismic, and LOCA/HELB testing. Copies of current test plans/procedures were provided to the inspection team (for subsequent NRC review/evaluation), and ITT established a point of contact for the NRC to obtain future test schedule information.

2. Tour of Test Facilities - The NRC inspection team toured the test facility to observe specific test apparatus which will be used to perform environmental qualification testing. At present ITT Barton has the in-house capability to perform all thermal aging on products that they are attempting to qualify to IEEE-323-1974. They have the capability to perform limited LOCA/HELB tests; however, their present test facility cannot meet the current required LOCA profiles and as a result LOCA/HELB testing is being performed by Westinghouse. They do not have the capability to accomplish radiation aging or seismic testing in-house; therefore, these tests are being performed by Rockwell (Canoga Park, California) and Southwest Research Institute (San Antonio, Texas), respectively.

ORGANIZATION: ITT BARTON INSTRUMENTS
CITY OF INDUSTRY, CALIFORNIA

REPORT NO.: 99900113/82-02	INSPECTION RESULTS:	PAGE 3 of 3

3. Witness of Test - At the time of this inspection, ITT had four model 763 gage pressure transmitters and four model 764 differential pressure transmitters installed in one of their environmental chambers. These transmitters were undergoing an 85-day post-LOCA test at 200° F and 95-100% relative humidity. All parameters examined by the inspection team were within test plan tolerances. This test was to be completed July 6, 1982, and ITT was informed that a member of the NRC Region IV Equipment Qualification Section would return to witness final functional testing and disassembly.

ORGANIZATION: LAKESIDE BRIDGE AND STEEL COMPANY
MILWAUKEE, WISCONSIN

REPORT NO.: 99900342/82-01	INSPECTION DATE(S) 5/3-7/82	INSPECTION ON-SITE HOURS. 26

CORRESPONDENCE ADDRESS: Lakeside Bridge and Steel Company
ATTN: Mr. W. E. Jonas
Director, Quality Assurance
5300 North 33rd Street
Milwaukee, Wisconsin 53207

ORGANIZATIONAL CONTACT: Mr. W. E. Jonas, Director, Quality Assurance
TELEPHONE NUMBER: (414) 462-5900

PRINCIPAL PRODUCT: Containment system components and component supports.

NUCLEAR INDUSTRY ACTIVITY: This company's nuclear production output was 36% during 1981.

ASSIGNED INSPECTOR: R E Oller 6-23-82
R. E. Oller, Reactive & Component Program Section (R&CPS) Date

OTHER INSPECTOR(S):

APPROVED BY: J. T. Conway for 6/24/82
I. Barnes, Chief, R&CPS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and 10 CFR Part 21.

B. SCOPE: Status of previous inspection findings; manufacturing process control; internal audits; nonconformances and corrective action; and 10 CFR Part 21.

PLANT SITE APPLICABILITY:

Nine Mile Point Nuclear Station, Unit 2, Docket No. 50-410.

ORGANIZATION: LAKESIDE BRIDGE AND STEEL COMPANY
MILWAUKEE, WISCONSIN

REPORT NO.: 99900342/82-01	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATIONS:

None

B. NONCONFORMANCES:

Contrary to Criterion V of Appendix B to 10 CFR Part 50 and the vendor's QA Manual, Revision 6, paragraph 7.2.1.1, the applicable revision level for procedure No. 4.1.2, was not entered on eight Manufacturing Process Sheets for Contract No. C-9233 at the completed straightening operation.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Unresolved Item B.4.c (80-02): Failure by Lakeside Bridge and Steel Company (LBS) to obtain a documented cause for a subcontractor's failure to identify rejectable indications during shop ultrasonic examination, as required by the ASME Code.

   The inspector verified that LBS had issued a corrective action request (no. 64) to the Chicago Bridge and Iron Company (CB&I) which was responsible for the ultrasonic testing. CB&I's response letter indicated that the cause of their failure to identify the indication was due to the use of a single 45° angle ultrasonic transducer examination method, which did not detect the indication due to the weld joint geometry. For future work with similar weld joints, CB&I indicated they will use both the 45° and the 60° angle transducer.

2. (Closed) Unresolved Item C.3.b (80-02): Failure by LBS to enter the correct Welding Procedure No. 49-B-U3b on the manufacturing process sheet controlling weld repairs of welds in a steam generator lateral support for Contract No. 91-82.

   The inspector verified that LBS had performed a complete review and upgrading of documentation on Contract No. 91-82 as requested by their customer. This upgrading would include correction of errors similar to the above item.

ORGANIZATION: LAKESIDE BRIDGE AND STEEL COMPANY
MILWAUKEE, WISCONSIN

REPORT NO.: 99900342/82-01	INSPECTION RESULTS:	PAGE 3 of 4

E. OTHER FINDINGS OR COMMENTS:

1. Manufacturing Process Control: The inspector reviewed three sections of the vendor's QA Manual, Revision 6, which were applicable to support steel fabrication control, welding, heat treatment, and special processes.

   Observations were made of identification markings of plates, parts and assemblies, torch cutting and heat treating facilities, weld material storage and issuance control; final painting of assemblies, and various stages of inprocess work.

   To verify that steel fabrication, inspection, and tests were controlled and documented in accordance with the NRC, ASME Code, and QA program requirements, a review was made of Contract No. 9233 documentation consisting of: nine process and inspection procedures; two welding procedure specifications and their supporting procedure qualification records; nine fabrication manufacturing process sheet (MPS) travelers; three MPS's including the welding and magnetic particle inspection records; four MPS's controlling steel plate cutouts; qualification records for painting and paint inspection personnel; four MPS repair records; a record of coating application; five multiprocess MPS's; an MPS covering heat treatment; a material receipt and identification Log; an identification of material list used by purchasing; qualification and certification records for three NDE technicians; weld wire identification and weld material issue records; ASME Code Section IX welder qualification records and weld process usage records for three welders; and the Stone and Webster procurement specification for LBS Contract No. C-9233, Nine Mile Point, Unit 2.

   Within this area, one nonconformance was identified (see paragraph B).

2. Internal Audits: The inspector reviewed Section 15, "Audits," of the vendor's QA Manual.

   To verify that planned periodic audits of all aspects of the QA program are performed in accordance with written procedures or checklists by qualified personnel, the results are documented and reviewed by management, and followup action is taken where indicated. A review was made of: two procedures covering auditor training and certification, and performance of internal audits; an audit schedule for 1981; five checklist records of audits and reaudits of all the

ORGANIZATION: LAKESIDE BRIDGE AND STEEL COMPANY
MILWAUKEE, WISCONSIN

REPORT NO.: 99900342/82-01	INSPECTION RESULTS:	PAGE 4 of 4

QA Manual areas performed in 1981 and 1982; a report of the Vice President's annual audit of the QA Director's activities; current records of qualification; and certification for nine audit personnel.

Within this area, no nonconformances or unresolved items were identified with respect to the requirements of the NRC, ASME Code, or the QA program.

3. Nonconformances and Corrective Action: The inspector reviewed Section 7, "Nonconformance and Corrective Action," of the vendor's QA Manual.

To verify that nonconforming items are reviewed and accepted, rejected, repaired, or reworked, and that conditions adverse to quality, including the cause, are promptly identified and corrected, a review was made of: 2 procedures; a nonconformance log; 10 nonconformance reports common to inprocess nonconformances for Contract No. C-9233; a corrective action log; 10 corrective action requests, and 3 corrective action summary reports.

Within this area, no nonconformance or unresolved items were identified with respect to the requirements of the NRC, ASME Code, or QA program.

4. 10 CFR Part 21: The inspector reviewed LBS Procedure No. 1.29, "Reporting of Defects and Noncompliance to NRC per 10 CFR Part 21," to verify that adequately documented measures are available to meet the reporting requirements of 10 CFR Part 21.

Observation was made of the posted LBS notice to employees regarding reporting of defects per 10 CFR Part 21.

Within this area, no violations were identified.

ORGANIZATION: MIDDLE SOUTH SERVICES, INC.
NEW ORLEANS, LOUISIANA

REPORT NO.: 99900515/82-01	INSPECTION DATE(S) 5/3-5/82	INSPECTION ON-SITE HOURS: 43

CORRESPONDENCE ADDRESS: Middle South Services, Incorporated
ATTN: Mr. D. C. Gibbs
Vice President
P. O. Box 61000
New Orleans, LA 70161

ORGANIZATIONAL CONTACT: Mr. R. T. Lally, QA Manager
TELEPHONE NUMBER: (504) 529-5262

PRINCIPAL PRODUCT: Engineering Services

NUCLEAR INDUSTRY ACTIVITY: Middle South Services employs approximately 746 personnel of which 6% are assigned nuclear, safety-related activities.

ASSIGNED INSPECTOR: R. H. Brickley 6/11/82
R. H. Brickley, Reactor Systems Section (RSS) Date

OTHER INSPECTOR(S): J. T. Conway, Reactive & Component Program Section
J. L. Carter, NRR, Observer
H. Komoriya, Argonne National Laboratory, Observer

APPROVED BY: C. J. Hale 6/11/82
C. J. Hale, Chief, RSS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: Initial management meeting, QA program assessment, and an inspection in response to a request from NRR regarding computer code RETRAN.

PLANT SITE APPLICABILITY:

ANO-1, ANO-2, Waterford 3, and Grand Gulf.

ORGANIZATION: MIDDLE SOUTH SERVICE, INC.
NEW ORLEANS, LOUISIANA

REPORT NO.: 99900515/82-01	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. Initial Management Meeting (R. H. Brickley) - A meeting was conducted with the management of Middle South Services, Inc., to acquaint them with the Licensee Contractor Vendor Inspection Program (LCVIP), the NRC organization relative to the Vendor Programs Branch, implementation of the LCVIP, and the types of documents generated and processed in implementing the program.

2. Validation of Computer Codes (R. H. Brickley) - This special inspection is part of a series of inspections being conducted at the request of NRR regarding the developemnt, verification, and use of the RETRAN computer code by the nuclear industry. The basic objectives of these inspections are to assure that the RETRAN computer code has been developed, maintained, and modified in accordance with the design control measures contained in ANSI N45.2.11-1974; and to verify that the organization's computer code activities address the requirements of 10 CFR Part 21 and 10 CFR Parts 50.55(e) and 50.59, as applicable.

   The Middle South Services, Inc., Quality Assurance Manual, Nuclear Quality Assurance Procedures, and Nuclear Analysis Procedures were reviewed to determine that applicable design control measures contained in ANSI N45.2.11-1974 were adequately addressed; i.e., inputs, interfaces, changes, and verification. The agreement between the Electric Power Research Institute and Middle South Services, Inc., two code documentation packages, and indoctrination and training records for six engineers were examined for implementation of procedural requirements.

   There were no violations, nonconformances, or unresolved items identified.

ORGANIZATION: MIDDLE SOUTH SERVICES, INC.
NEW ORLEANS, LOUISIANA

REPORT NO.: 99900515/82-01	INSPECTION RESULTS:	PAGE 3 of 3

3. QA Program Evaluation (J. T. Conway) - The Middle South Services, Inc., Nuclear Quality Assurance Manual and Nuclear Quality Assurance Procedures Manual were reviewed to determine that the QA program was being implemented consistent with quality and technical commitments. Specific areas evaluated are as follows: organizational provisions for assuring the proper implementation of the QA program; QA records for eight individuals to assure adequacy of personnel qualifications, particularly in the area of auditing; document control measures pertaining to the QA manual and related procedures; three management audit files, seven internal audit files, and nine external audit files, to verify compliance with all aspects of the QA program and to determine the effectiveness of the QA program; and provisions for QA records that furnish evidence of activities affecting quality.

   There were no violations, nonconformances, or unresolved items identified.

ORGANIZATION: NUS CORPORATION
GAITHERSBURG, MARYLAND

REPORT NO.: 99900516/82-01	INSPECTION DATES: 5/24-28/82	INSPECTION ON-SITE HOURS: 60

CORRESPONDENCE ADDRESS: NUS Corporation
ATTN: Dr. W. J. Gallagher, Senior Vice President
Division Operations
910 Clopper Road
Gaithersburg, Maryland 20878

ORGANIZATION CONTACT: M. R. Booska, Director, Corp. QA-Division Operations
TELEPHONE NUMBER: (301) 258-6000

PRINCIPAL PRODUCT: Engineering Consultant Activities

NUCLEAR INDUSTRY ACTIVITY: NUS Corportion has three divisions that are involved in nuclear safety-related projects. The current level and type of activity is approximately as follows: Engineering Division - 18 contracts (piping analysis, fuel storage rack design, control room habitability design, fire protection modifications, equipment evaluation/qualification, system/component performance analysis and design, (con't on next page)

ASSIGNED INSPECTOR: C J Hale /for 7/2/82
D. D. Chamberlain, Reactor Systems Section (RSS) Date

OTHER INSPECTOR(S): J. Conway, Reactive and Components Program
U. Potapovs, Chief, Vendor Programs Branch

APPROVED BY: C J Hale 7/2/82
C. J. Hale, Chief, RSS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B

B. SCOPE: QA Program Evaluation

PLANT SITE APPLICABILITY: This inspection relates to the following plant dockets: 50-358 and 50-359.

ORGANIZATION: NUS CORPORATION
GAITHERSBURG, MARYLAND

REPORT NO.: 99900516/82-01	INSPECTION RESULTS:	PAGE 2 of 4

NUCLEAR INDUSTRY ACTIVITY: (Cont.)
etc.); Consulting Division - 17 contracts (hazards analysis, system/component/compartment analysis, QA support, control room habitability study, independent review of purchase specifications, etc.); and Environmental Division - 14 contracts (environmental studies, licensing support, meteorological services, radiological services, etc.).

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50, Section 7.4 of QAP 2.3 and Section 7.2 of QAP 6.1, a review of document control activities for one project (No. 3366) revealed the following: QA personnel and the Operations Manager in the NUS-Gaithersburg, Maryland, Office did not receive any copies of controlled documents, including the QA Plan; and there was no evidence of Document Transmittal Forms or a Document Receipt Log.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50, Section 1.1 of QAR 17.0, Sections 7.1 and 7.2 of QAP 17.1, and Section 7.1.2 of QAP 17.3, a review of QA records and documentation supplied the NRC inspector revealed the following: QA Record Index was missing for two projects; QA Record Log was missing for five projects; audit reports for 1981 and one QA Plan were not identified as QA records; and personnel qualifications were missing.

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

QA Program Evaluation - The purpose of this area of inspection was to perform an initial evaluation of the NUS QA program. It was determined that NUS Corporation has three divisions that are involved in nuclear safety-related activities. The three divisions are the Engineering Division, the Consulting Division, and the Environmental Division. Each of the three divisions has an independent QA program manual and implementing procedures/instructions. NUS also has a Corporate QA whose function is "primarily an internal management overview designed to inform Corporate and Operating Unit Management of the adequacy of program implementation as determined by independent second party audit." This inspection covered the Engineering Division and the Consulting Division.

ORGANIZATION: NUS CORPORATION
GAITHERSBURG, MARYLAND

REPORT NO.: 99900516/82-01	INSPECTION RESULTS:	Page 3 of 4

1. Engineering Division - The NUS Engineering Division Quality Assurance Manual and applicable procedures governing the areas of QA program, organization, engineering control, procurement control, QA records, and audits were examined to determine that they were consistent with quality and technical commitments to codes, standards, regulations, and guides. The following documentation of completed work in these areas was examined to verify implementation of program commitments: 1 document transmittal record; 3 purchase orders; 1 corporate QA audit report; training records for 5 personnel; 1 design/input requirements document; 8 drawings; 2 QA plans; 2 vendor specifications; 12 analysis packages; 2 specifications; 3 design change notices; 2 vendor surveillance/audit reports; second quarter audit schedule; and 2 internal audit reports. Within the scope of this inspection of the Engineering Division, it was determined that the QA program requirements were being implemented. The following two items were identified for followup during future inspections:

   a. During the review of the Sargent and Lundy (S&L) piping analysis contract on the Zimmer project, it was noted that certain dead weight loadings provided by S&L were identified as preliminary values. NUS performed the analysis based on these values and returned the analysis packages. A followup inspection of this area will be conducted at S&L to determine how the preliminary dead weight loadings will be finalized.

   b. During the review of the NUS Engineering Division training program, it was noted that the Engineering Department Procedure (EDP-20) for personnel training was revised in February 1982, to establish a matrix for minimum training requirements for all disciplines. An internal audit of this area identified that full implementation of the training requirements is not complete. A followup inspection of NUS corrective actions in this area will be conducted.

2. Consulting Division - The QA program for the NUS Consulting Division was evaluated particularly in the areas of organization, training, document control, QA records, and audits to determine if activities were being implemented consistent with quality commitments contained in the QA manual. A detailed review of documentation (e. g., QA manuals, procedures, and reports) and detailed discussions with NUS personnel were conducted to verify implementation of program commitments. Two nonconformances (B.1 and B.2 above) were identified relating to document control and QA records. Also, the following was identified to NUS management regarding the Consulting Division organizational structure.

ORGANIZATION: NUS CORPORATION
GAITHERSBURG, MARYLAND

REPORT NO.: 99900516/82-01	INSPECTION RESULTS:	Page 4 of 4

The QA Manual organization charts do not clearly identify all the organizational elements that function under the cognizance of the QA program, including those groups providing QA services to customers. In addition, the interrelationship and areas of responsibility and authority of each of the organizational elements are not described. This area will be inspected further during subsequent inspections.

ORGANIZATION: NATIONAL TECHNICAL SYSTEMS
SAUGUS, CALIFORNIA

REPORT NO: 99900907/82-01	INSPECTION DATE(S) 6/7-10/82	INSPECTION ON-SITE HOURS: 81

CORRESPONDENCE ADDRESS: National Technical Systems (NTS)
ATTN: Mr. Arthur Edelstein
Executive Vice President, Engineering
26525 Golden Valley Road
Saugus, CA 91350

ORGANIZATION CONTACT: Mr. A. Edelstein
TELEPHONE NUMBER: (805) 251-6622

PRINCIPAL PRODUCT: Equipment testing

NUCLEAR INDUSTRY ACTIVITY: Approximately 15% of the facility capacity and total man hours are involved in testing of equipment for the nuclear power industry.

ASSIGNED INSPECTOR: J. R. Agee — 8/3/82
J. R. Agee, Equipment Qualification Section (EQS) — Date

OTHER INSPECTORS: A. L. Smith, EQS
J. J. Benson, Consultant, Sandia National Laboratories

APPROVED By: H. S. Phillips — 8-3-82
H. S. Phillips, Chief, EQS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B, 10 CFR Part 21, and NTS Quality Procedures Manual

B. SCOPE: The inspection was the initial inspection to evaluate the test facility, examine the test specimen, inspect the test fixture and test setup, review the test plan, verify the thermal aging analysis, and review the quality assurance manual.

PLANT SITE APPLICABILITY:

This inspection applies to Docket No. 50-382.

ORGANIZATION: NATIONAL TECHNICAL SYSTEMS
SAUGUS, CALIFORNIA

REPORT NO: 99900907/82-01	INSPECTION RESULTS:	PAGE 2 of 5

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Company Organization and Quality Assurance Program -

The NTS Testing Division is engaged only in providing testing services and has no charter for manufacturing facilities. The test facility provides testing for the military, commercial organizations, and the nuclear industry. Currently, the facility uses about 15% of its manpower in testing for the nuclear industry. There are about 100 employees at the Saugus, California, facility consisting of the following approximate percentages: professional-30, administrative-15, technicians-40, and maintenance-15.

The Saugus facility has been active for several years but has just recently initiated testing of nuclear safety related equipment. Saugus has the capability for testing to the full spectrum of environmental qualification except for radiation. That work is contracted to others.

NTS facility at Chatsworth, California, is currently being moved to Saugus and is being combined with the Saugus capabilities. The move and the merging of the two test facilities should be completed by October 1982.

The Quality Assurance Program was based on the Quality Procedures Manual which describes a quality control program that has been established to comply with the requirement of MIL-I-45208A and those portions of MIL-Q-9858A, MIL-C-45662A, and the NASA Handbook (NHB) 5300.4 (1C) that are applicable to a testing laboratory. The Quality Procedures Manual contains an Appendix entitled "Supplementary Quality Procedures Manual for Nuclear Power Industry Contracts." This supplement addresses compliance to the criteria of 10 CFR 50, Appendix B. The Quality Procedures Manual is in the midst of a gross revision resultant from the move of the Chatsworth facility to the Saugus site and the combination of the test programs of the two test facilities. The consolidation of the two QA programs is scheduled for completion by late June 1982. The total QA program will be reviewed in a followup inspection.

2. Test Facility and Test Setup

The Saugus test facility was examined for capabilities for conducting a LOCA/HELB test. The facility currently has the capability for conducting the required thermal aging test for the Borg-Warner Valve Actuator test but cannot yet accomodate the HELB test. Equipment and test setup for LOCA/HELB testing existed at the NTS, Chatsworth, California, facility and is now being transferred and installed at the NTS, Saugus, California, test site. The equipment will be installed and ready for LOCA/HELB testing by late summer 1982.

The NTS test procedure for the Borg-Warner thermal aging test had been submitted for final review and approval by Borg-Warner. Borg-Warner is currently completing the final acceptance test procedure (ATP) and checklist for the functional testing and development of baseline test data for the thermal aging test.

An inspection was made of the two separate test buildings where the thermal aging for the electronic controls and the test specimen (electrohydraulic valve actuator) will be conducted. The controls will be thermally aged in a 27 cu. ft. oven at 257^{o} F in which a minimum number of thermocouples will be used for temperature/heater controls and recording.

No redundant thermocouples are planned for temperature gradient measurements nor are spare thermocouples planned for the controls or recording.

The valve actuator will be thermally aged at 300° F in a separate 48 cu. ft. oven. The same philosophy will be followed in the use of a minimum number of thermocouples as used for the temperature measurements, controls, and recording in the 27 cu. ft. oven.

The Saugus test facility has the capability for transmitting all test data into a central data aquisition system for storage.

3. Test Procedure:

Test procedure 528-0847, Nuclear Qualification of a Modulating Electro-hydraulic Operator, P/N 85280 was reviewed to: (a) determine compliance with criteria specified in IEEE Standards 323-1974, 344-1975, and 382-1980; (b) verify thermal aging calculations and conclusions; and (c) verify the radiation aging analysis. During the course of this evaluation the inspectors reviewed the applicable IEEE Standards, performed independent thermal aging calculations, interviewed the cognizant NTS Nuclear Analysts, and reviewed five references contained in section 2.3 of Exhibit I to the Test Procedure to verify referenced technical information. The findings of the inspectors were:

a. NTS Test Procedure 528-0847 is consistent with the criteria and requirements contained in IEEE Standard 323-1974, 344-1974, and 382-1980.

b. NTS used the temperature/time relationship established in the Arrhenius chemical reaction rate theory to determine the time required for the accelerated aging of the specimen components. The inspectors performed independent calculations for the actuator module (paragraph 5.3.3.2 of Exhibit I), motor module (paragraph 5.3.3.3 of Exhibit I), and the servo amplifier module (paragraph 5.3.3.4 of Exhibit I). The results of the calculations performed by the inspectors and those contained in the above sections were in agreement.

c. For operation cycle aging NTS has chosen to substitute 250,000 cycles of operation at 80% stroke (with a 2000 lb. load) for 10^6 cycles at 20% stroke. Review of IEEE 382-1980 revealed that only 10^5 cycles were required, therefore, the test is more severe than the IEEE requirements.

As a result of this review the following items will require additional evaluation:

ORGANIZATION: NATIONAL TECHNICAL SYSTEMS
SAUGUS, CALIFORNIA

REPORT NO: 99900907/82-01	INSPECTION RESULTS:	PAGE 5 of 5

a. Appendix A, "Borg-Warner Nuclear Valve Division Acceptance Test Procedure," to NTS Procedure 528-0847 was not available for review at the time of this inspection. This appendix will be reviewed as soon as it is available.

b. The DC motor brushes were not considered when NTS performed the thermal aging analysis. NTS is to investigate the brush material to determine if it has any impact on the thermal aging analysis. This item will be reviewed during the next visit to NTS.

c. NTS Procedure 528-0847 indicates the valve operator will be mounted in only one position (vertical) during qualification testing. Previous discussions with the Borg-Warner Project Manager indicated that the operator was to be qualified for installation in several positions. NTS will contact Borg-Warner and establish if additional mounting orientations are desired.

d. Exhibit I, "Analysis Report," to NTS Procedure 528-0847 did not contain radiation specifications for the Syncotemp Hydraulic Fluid or the Loctite Magnet Cement. NTS is waiting for this information from Borg-Warner. This item will be reviewed during the next visit to NTS.

e. The P/N for the test specimen as contained in NTS Procedure 528-0847 and the Borg-Warner drawing are not the same. NTS personnel were made aware of this and are resolving the matter with Borg-Warner.

ORGANIZATION: NATIONAL VALVE AND MANUFACTURING COMPANY
PITTSBURGH, PENNSYLVANIA

REPORT NO.: 99900023/82-01	INSPECTION DATE(S) 4/19-21/82	INSPECTION ON-SITE HOURS: 20

CORRESPONDENCE ADDRESS: National Valve and Manufacturing Company
ATTN: H. E. Haller, President
Post Office Box 100
Pittsburgh, Pennsylvania 15230

ORGANIZATIONAL CONTACT: R. W Jackson, Quality Assurance Manager
TELEPHONE NUMBER: (412) 963-8200

PRINCIPAL PRODUCT: Nuclear Piping Subassemblies

NUCLEAR INDUSTRY ACTIVITY: National Valve and Manufacturing Company (Navco) does not have any current nuclear contracts for nuclear piping subassemblies.

ASSIGNED INSPECTOR: T. Conway /for — 6/15/82
H. W. Roberds, Reactive and Components Program Section (R&CPS) — Date

OTHER INSPECTOR(S):

APPROVED BY: T. Conway /for — 6/15/82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B

B. SCOPE: This inspection was made at the request of Region II of the Nuclear Regulatory Commission in regard to the identification by the Tennessee Valley Authority Bellefonte site of: (1) deficient radiographic examination techniques for Unit 2 piping subassemblies; (2) deficient welds in Unit 1 piping subassemblies; (3) lack of fusion in the longitudinal weld of a SA 312 Type 304 pipe furnished to Unit 2; and (4) inside diameter laps in 6-inch Schedule 160 SA 106 Grade B pipe furnished to Unit 2.

PLANT SITE APPLICABILITY:

50-438 and 50-439.

ORGANIZATION: NATIONAL VALVE AND MANUFACTURING COMPANY
PITTSBURGH, PENNSYLVANIA

REPORT NO.: 99900023/82-01	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS

None

D. OTHER FINDINGS OR COMMENTS

1. Deficient Surface Preparation of Welds in Navco Fabricated Pipe Subassemblies to Bellefonte, Unit 1 - As a result of a joint inspection by Navco and TVA personnel on July 7, 1981, at the Bellefonte site, Navco agreed that the grinding on some welds was substandard to the usual workmanship performed by Navco personnel. Although all weld surfaces were within the ASME Code requirements, 41 piping subassemblies were returned to Navco for rework which consisted of buffing the welds with flapper wheels. All welds were visually examined and rework was completed on September 16, 1981.

2. Deficient Radiographic Examination Technique for Welds in Piping Subassembly 1NM-219 Fabricated by Navco for Bellefonte, Unit 2 - During installation of the spent fuel system piping in the Unit 2, weld no. 437 in piping subassembly 1NM-219 was observed to exhibit possible excessive root reinforcement. As a result of TVA's review of radiographs for weld no. 437, Navco radiographic technique was questioned relative to meeting all of the requirements of the Winter 1975 Addenda to Article 2 of ASME Section V. The radiographic technique for weld no. 437, was a panoramic exposure and where the bottom film overlapped the adjacent film approximately 2 inches on the bottom radiograph did not meet the density requirements of the ASME Code which was questioned by the TVA radiographic interpreter. However, the overlapped area does meet the density requirements of the ASME Code on the preceding radiograph. TVA performed an extensive review of Navco radiographs produced in the years 1976, 1977, 1978, and 1979; and as a result of the review, the Navco radiographic techniques were found to be in compliance with ASME Code requirements.

ORGANIZATION: NATIONAL VALVE AND MANUFACTURING COMPANY
PITTSBURGH, PENNSYLVANIA

REPORT NO.: 99900023/82-01	INSPECTION RESULTS:	PAGE 3 of 3

3. Lack of Fusion in the Longitudinal Weld of SA 312 TP 304 Pipe Purchased by Navco from SWEPCO for Bellefonte, Unit 2 - As a result of radiographic examination of a circumferential piping butt weld, an indication was observed in the intersecting longitudinal weld which appeared to be lack of fusion. The pipe was removed and destructively examined. This test revealed that the indication was a root shrinkage condition and not lack of fusion. The indication was observed to have a smooth transition and did not impede on the minimum wall thickness requirement.

4. Laps in 6-inch Schedule 160 SA 106 B Pipe Purchased by Navco From Guyon Alloys for Fabrication of Piping Subassemblies for Bellefonte, Unit 2 - In the process of machining a counter bore in a length of SA 106 Grade B pipe, a lap was revealed and Navco issued a nonconformance notice (E130) on March 16, 1979. Further investigation identified three lengths of pipe where the depth of the lap exceeded the allowable 12½% of the wall thickness of the pipe. Guyon Alloys and the pipe manufacturer, U.S. Steel, were notified of this discrepant condition on April 12, 1979.

   In a letter to Guyon Alloys of August 9, 1979, U.S. Steel refused to pay for additional inspection to determine the acceptability of the SA 106 pipe but would replace rejected pipe with verified excessive ID lap seams. Navco has inspected all Schedule 160 SA 106 pipe in stock; however, some pipe spools had been fabricated and shipped to Bellefonte, Unit 2, prior to detection of the deficient condition. Navco informed TVA relative to the defective pipe, and as a result a lap was identified in pipe spoolpiece No. 2CH-28 Auxiliary Feed System that had been shipped to Bellefonte, Unit 2.

ORGANIZATION: NUCLEAR VALVE DIVISION
BORG WARNER CORPORATION
VAN NUYS, CALIFORNIA

REPORT NO.: 99900289/82-01	INSPECTION DATE(S) 3/22-25/82	INSPECTION ON-SITE HOURS: 56

CORRESPONDENCE ADDRESS: Nuclear Valve Division
Borg Warner Corporation
ATTN: Mr. A. L. DuBrow, President/General Manager
7500 Tyrone Avenue
Van Nuys, CA 91409

ORGANIZATIONAL CONTACT: Mr. P. L. Milinazzo, Manager, Quality Assurance
TELEPHONE NUMBER: (213) 781-4000

PRINCIPAL PRODUCT: Nuclear Valves.

NUCLEAR INDUSTRY ACTIVITY: Commercial nuclear production of the Nuclear Valve Division of Borg Warner Corporation totals 50% of company production.

ASSIGNED INSPECTOR: J. T. Conway for — 6-11-82
J. W. Sutton, Reactive & Component Program Section (R&CPS) — Date

OTHER INSPECTOR(S): W. D. Kelley, R&CPS

APPROVED BY: J. T. Conway for — 6-11-82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made as a result of the identification by: (1) Duke Power Company of internal binding in 8-inch gate valves furnished to Catawba 1 and 2; and by (2) Tennessee Valley Authority concerning the specification on a Borg Warner drawing of excessive bolt torque for a flow control valve furnished to Bellefonte 1 and 2. Additional areas included in the inspection were followup on identified low torque values in bonnet to
(cont. on next page)

PLANT SITE APPLICABILITY:

50-413/414; 50-438/439.

ORGANIZATION: NUCLEAR VALVE DIVISION
BORG WARNER CORPORATION
VAN NUYS, CALIFORNIA

REPORT NO.: 99900289/82-01	INSPECTION RESULTS:	PAGE 2 of 7

SCOPE: (cont.) body studs/nuts at Bellefonte 1 and 2, status of previous inspection findings, nonconformance/corrective action, manufacturing process control/machining, and design control.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 3.5.3, in Section 3 of the Nuclear Products Quality Assurance Manual, required design changes were not made in the preparation of Drawing No. 80590 (12-inch, 1500-pound, motor-operated gate valve) from Drawing No. 80600 (14-inch, 1533-pound, motor-operated gate valve), as evidenced by the failure to reduce the 500 to 550 foot-pound torque requirement listed by Drawing No. 80600, on changing the stud diameter to 3/4-inch from 1¼-inch.

C. UNRESOLVED ITEMS:

During review of the identified problem concerning low bolting torque values in valves furnished to Bellefonte, the NRC inspector established that the Borg Warner Nuclear Valve Division (BW-NVD) had used a minimum design seating stress of 4500 psi for spiral wound metal-asbestos filled gaskets. This value was consistent with the requirements of the contractually applicable Code (Winter 1975 Addenda), but was noted to have been subsequently raised to 10,000 psi by the Winter 1976 Addenda. Paragraph 2.4.7 of Section 2 of the QA Manual requires the QA Manager to review new Code Addenda to maintain the adequacy of the QA Program Manual, but does not address how code changes in engineering requirements would be reviewed and incorporated into the QA program. The NRC inspector was informed that the Engineering Department performed a review of new Code Addenda, but this was accomplished only on a verbal basis. Insufficient time was available to verify that the Engineering Department was incorporating changes in code requirements into design criteria. This subject and the specific example of change in design seating stress will be reviewed at the next scheduled inspection.

ORGANIZATION: NUCLEAR VALVE DIVISION
BORG WARNER CORPORATION
VAN NUYS, CALIFORNIA

REPORT NO.: 99900289/82-01	INSPECTION RESULTS:	PAGE 3 of 7

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Nonconformance 1 (Report No. 81-02): Welder observed not maintaining electrical characteristics specified in approved welding procedures during valve hardfacing operations.

   The inspector reviewed the corrective action taken by NVD to correct this item. The revised welding procedure, qualification of the revised procedure and documentation of welders' training were reviewed to substantiate the corrective action.

2. (Closed) Nonconformance 2 (Report No. 81-02): Special Review Board for 10 CFR Part 21 was not convened to review reported Part 50.55(e) report by Duke Power Company as required by the QAM.

   The inspector reviewed the revised organizational changes which NVD indicated in their response of January 4, 1982, would prevent recurrence of an item of this type. The inspector concurs that the organizational change made by NVD will prevent recurrence.

E. OTHER FINDINGS OR COMMENTS:

1. Duke Power Company (DPC): Catawba Nuclear Station, Units 1 and 2 - Problem reported was inoperability of 8-inch gate valves used for isolation of the essential from nonessential loads, due to internal binding.

   a. Background

      DPC notified the NRC on July 1, 1981, that BW-NVD Valve 1KC230 failed during dry cycling due to the valve disc becoming wedged between the body guides. The problem was subsequently identified to result from sharp leading edges on the gate guides producing gouging, and was established by testing to be liable to occur with the valve installed in a system with the stem between 22½° and 157½° from vertical. This subject was initially followed up at BW-NVD during the October 5-9, 1981, inspection (Report No. 99900289/81-02).

b. Findings

The NRC inspected the gate valve used in the operability test of the valve in various positions in a horizontal pipe line. The square edges of the guide groove in the gate had been ground to assure a generous radii. The inspector reviewed the operability test data of the valve with the modified gate in a vertical pipe line. The test data verified no binding during operation.

BW-NVD has received answers from their customers regarding the installed position of the valves in service; however, some of the valve's positions were assumed from information taken from the piping and instrumentation drawing. This item will be further reviewed during a followup inspection.

2. Tennessee Valley Authority (TVA) - Bellefonte Nuclear Plant, Units 1 and 2 - Problem reported was improper torquing of valve body to bonnet studs.

a. Background

TVA notified BW-NVD by TLX dated January 6, 1982, that their field forces had found the body to bonnet studs torqued to values less than the torque specified on the BW-NVD assembly drawings. TVA stated that the cause of the deficiency could be due to TVA's construction forces dismantling the valves and their failure to properly torque the studs during reassembly; however, valves stored in the site warehouse were uncrated, torque checked, and found to be deficient. TVA informed BW-NVD that this nonconformance had been evaluated as a significant condition and had been reported to the NRC under both 10 CFR Part 50.55(e) and 10 CFR Part 21.

b. Findings

Paragraph 10.0 of TVA Contract 77K38-86163-8, dated July 7, 1976, states in part, "The edition, revision and/or addenda in effect when the contract is awarded shall apply unless later revisions are agreed by both parties." BW-NVD designed their valves for this purchase order in accordance with 1975 Winter Addendum of Section III to the ASME Code. Table XI-3221.1-1, Appendix XI of Section III states that the minimum design seating stress (y) for spiral wound metal-asbestos filled gaskets is 4500 psi; however, the 1976 Winter Addendum subsequently raised this minimum design seating stress to 10,000 psi.

ORGANIZATION: NUCLEAR VALVE DIVISION
BORG WARNER CORPORATION
VAN NUYS, CALIFORNIA

REPORT NO.: 99900289/82-01	INSPECTION RESULTS:	PAGE 5 of 7

After BW-NVD received TVA's TLX 910-495-1726 dated January 6, 1982, they contacted the gasket manufacturer, who recommended that a design seating factor of 15,000 psi be used for their spiral wound metal-asbestos filled gaskets. BW-NVD reviewed the design of the body to bonnet bolting of their 150 and 300 pound class check and gate valves, and determined that the bolting met ASME Code requirements with the higher gasket seating factor; however, the torque values had to be increased.

BW-NVD's 10 CFR Part 21 Review Board Committee convened on February 16, 1982, and concurred with the engineering analyses that the low torque condition was a result of the valve body/bonnet gasket having taken a permanent set during storage, thus, reducing the gasket load on the studs and nuts and contributing to the low torque condition. BW-NVD evaluated the low torque condition as not being " . . . a defect which could create a substantial safety hazard . . . ."; therefore, a report was not made to NRC by BW-NVD.

As a result of the BW-NVD engineering analyses of the reported condition, all torque values of the bolted bonnet valves were revised to exceed the current ASME Code requirements and meet the gasket manufacturer's recommendation, in order to reduce the effects of "gasket set" that could occur after shop hydrostatic test and storage on site. Presently, all customers who have purchased bolted bonnet valves have been notified of the new torque recommendation for their valves and the torque valves on all assembly drawing are to be corrected and approved, and the revised assembly drawing sent to the customers.

3. Tennessee Valley Authority: Bellefonte Nuclear Plant Unit 1 & 2 - Problem reported was excessive torque specified on BW-NVD drawing for the studs affixing the adapter to the yoke of a residual heat removal isolation valve.

   a. Background

      TVA notified NRC on January 5, 1982, that during torquing in the field of the bolting for assembly of the motor operator adaptor to the yoke of a Bellefonte Nuclear Plant residual heat removal isolation valve, the 3/4-inch bolts became overstressed.

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The BW-NVD assembly drawing number 80590 stated the torque for these bolts should be in the 500-550 foot-pound range. TVA contacted BW-NVD and was informed that the drawing was in error, with the correct torque being in the 120 to 140 foot-pound range.

b. Findings

BW-NVD Drawing Number 80590 for the TVA Bellefonte Nuclear Plant, Units 1 and 2, 12-inch, 1500-pound, motor-operated gate valves was made by reproducing the mylar master of Drawing No. 80600 for a 14-inch, 1533-pound, motor-operated gate valve. Drawing 80600, Revision F, requires eight 1⅛-inch ASTM A564, Type 630, studs (Item 30) torqued to 500 to 550 foot pounds, to affix the adaptor (Item 18) to the yoke (Item 15). When the reproduction was modified to meet the design requirements for the 12-inch, 1500-pound gate valve, the size of the studs was changed to 3/4-inch diameter, but note 32 on the drawing which specified the torque was not changed.

Subsequent to the notification by TVA that the studs were overtorqued, BW-NVD QA informed engineering of the problem. The project engineer reviewed the drawing, noted and revised the torque requirement on Drawing No. 80590 on October 15, 1981, instituted a computerized check for all customers that had received 1500-pound gate valves, and verified that the correct torque values were specified on all assembly drawings except drawing number 80590.

One nonconformance was identified.

4. Design Control - Reviewed three sections of the QA Manual, three drawings, the analysis report for the hydraulic modulating operator, one system description, four schematic diagrams, and the qualification test procedure for a pneumatic-hydraulic modulating operator. Verified procedures had been implemented to control review, approval, release and issuance of design documents.

5. Nonconformance/Corrective Action - The inspector reviewed NVD's QA Manual Section 15-16, 13 material review reports, 15 material group tickets, and associated documentation to determine compliance to QA/QC requirements/procedures. The corrective action taken to prevent recurrence was examined for implementation. Segregation

areas designated for storage of nonconforming items were inspected. Relative to the documents examined, the inspector determined that activities relating to the control and disposition of nonconforming items complied with NVD's QA/QC program requirements.

6. Manufacturing Process Control - The inspector reviewed NVD's QA Manual Section 9, 13 machine drawings, 9 shop outlines, 2 manufacturing outlines, and associated documentation to determine if designated controls of the machining operations were being implemented. The inspector also observed machining operations on 10 production machines. As a result of this review, the inspector determined that the machining operations of NVD were being controlled as required by QA/QC requirements.

ORGANIZATION: NUTHERM INTERNATIONAL, INCORPORATED
MOUNT VERNON, ILLINOIS

REPORT NO.: 99900779/82-01	INSPECTION DATE(S): 6/21-25/82	INSPECTION ON-SITE HOURS: 28

CORRESPONDENCE ADDRESS: Nutherm International, Incorporated
ATTN: Mr. R. Hanner
President
501 South 11th Street
Mount Vernon, IL 62864

ORGANIZATION CONTACT: Mr. J. S. Hanner, Manager-Quality Assurance
TELEPHONE: (618) 244-6000

PRINCIPAL PRODUCT: Environmental Control and Systems

NUCLEAR INDUSTRY ACTIVITY: Approximately 75 percent

ASSIGNED INSPECTOR: T. Conway for — 7/30/82
W. E. Foster, Reactive & Components Program Section (R&CPS) — Date

OTHER INSPECTOR(S):

APPROVED BY: T. Conway for — 7/30/82
J. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: Appendix B to 10 CFR Part 50; and 10 CFR Part 21.

B. SCOPE: This inspection was made as a result of the issuance of a 10 CFR Part 50.55(e) report by the Tennessee Valley Authority on May 14, 1982. The report pertained to deficiencies in the test program and referenced hardware furnished to the Watts Bar, Bellefonte, and Yellow Creek Nuclear Power Plants.

PLANT SITE APPLICABILITY: Dockets 50-259/260; 50-424/427; 50-410; 50-461/462; and 50-412.

ORGANIZATION: NUTHERM INTERNATIONAL, INCORPORATED
MOUNT VERNON, ILLINOIS

REPORT NO.: 99900779/82-01	INSPECTION RESULTS:	PAGE 2 of 5

A. VIOLATIONS:

Contrary to Section 21.6 of Title 10, Part 21 of the Code of Federal Regulations, dated December 18, 1981, posting of 10 CFR Part 21, Section 206 of the Energy Reorganization Act of 1974, adopted procedures, or an appropriate notice had not been accomplished.

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and paragraph 6.1.1 of the Quality Assurance Manual, No. QA-N-10179-3, Revision 3, dated October 2, 1981, (hereafter referred to as QAM):

   a. The assembly of heater elements had not been covered by written manufacturing instructions and engineering procedures or drawings. Consequently, assembly personnel had no written information regarding mounting hardware and tightening requirements.

   b. The bending of Part No. 064 was not being performed as required by Drawing No. 7003-51054-23, dated March 31, 1982. Rather, the designated portion (3 inches by 38.375 inches) was sheared and reattached, at 90 degrees, by welding.

   c. Wiring was not being performed as indicated on Drawing No. 1023-51151-43, Revision 1, dated April 8, 1982. The wire being used was manufactured by Rockbestos while the drawing specified wire manufactured by National.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and paragraph 7.1.1 of the QAM, numerical control programs and tapes which describe activities affecting quality had not been reviewed for adequacy and approved for release, prior to usage.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and paragraph 10.1.3.1(2) of the QAM:

   a. Welding of Part No. 064 (Drawing No. 7003-51054-23, dated March 31, 1982) was not being performed in accordance with a qualified procedure inasmuch as the procedure being used required E 70S-6 filler metal while that being used was E70S-3.

   b. The electrode wire speed was computed to be approximately 284 inches per minute rather than the specified 170-205 inches per minute, during performance of the welding on Part No. 064.

ORGANIZATION: NUTHERM INTERNATIONAL, INCORPORATED
MOUNT VERNON, ILLINOIS

REPORT NO.: 99900779/82-01	INSPECTION RESULTS:	PAGE 3 OF 5

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and paragraph 16.1.4 of the QAM, the disposition of all nonconforming parts had not been noted in the Inspection Report-Quality Assurance, for a remote control panel for Project No. A-1089. Three nonconforming conditions had been recorded at Operation No. 3, only one had been dispositioned, but the operation had been accepted.

5. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraph 4.1.2 and its subparagraph (c) of the QAM, design drawings had not been prepared in accordance with contractual requirements as evidenced by Drawing Nos. 1023-51153-33, and 1023-51151-43, both are Revision 1, dated April 8, 1982. The drawings specified wire manufactured by Marathon and National, respectively; while the customer specification required wire manufactured by Cerro Wire and Cable Company.

6. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and paragraph 11.1.2 of the QAM, purchaser witness and hold points (welding and shop tests) required by Purchase Order No. 91-1325-226, dated November 9, 1981, had not been indicated in the Inspection Reports-Quality Assurance for the remote control panel and electric air handling heater for Project No. A-1089; nor had documented exceptions been taken as required by Note 2 of the purchase order.

7. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and paragraph 13.1.1 of the QAM, wire terminal crimping tools (hand and bench mounted) had not been controlled by written procedures to assure calibration.

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMMENTS:

1. Initial Management Meeting and Exit Interview - Management representatives were provided with an overview of the organization of the Commission. They were informed of the authority and responsibility contained in Section 206 of the Energy Reorganization Act of 1974. Also, information regarding 10 CFR Part 21 was provided. The scope of the inspection and reporting were explained. At the exit, content of responses and handling of proprietary information was addressed, as well as the findings of this inspection. Throughout the inspection, personnel expressed a genuine desire to satisfy all requirements of the nuclear program. During the course of this inspection, this determination was exhibited by initiating positive corrective actions.

ORGANIZATION: NUTHERM INTERNATIONAL, INCORPORATED
MOUNT VERNON, ILLINOIS

REPORT NO.: 99900779/82-01	INSPECTION RESULTS:	PAGE 4 OF 5

Management personnel provided a history of the company, products supplied and nuclear involvement. They expressed the intent of staying in the nuclear business and maintaining a quality program that satisfied the requirements.

2. Followup on a Regional Request - The Tennessee Valley Authority filed a 10 CFR Part 50.55(e) report with the Nuclear Regulatory Commission, Region II, on May 14, 1982. The report pertained to inadequate documenting and reviewing of test results. The report identified Bellefonte, Watts Bar, and Yellow Creek Nuclear Power Plants as the affected sites.

   The inspector reviewed test results forms of completed tests and verified that test data is being documented; test data is also being evaluated by Quality Assurance and Engineering personnel. Details of this activity are covered in Quality Assurance Procedure No. 615, Revision 2, dated May 6, 1982.

   In order to comply with the regional request, manufacturing process control, change control, audits, and quality assurance records were selected for inspection. However, manufacturing process control was the only facet inspected. Adequate corrective actions and preventive measures had been taken in the test control element; however, nonconformances were observed in the other elements of manufacturing process control. Within this area of the inspection, the following documents were evaluated: (1) 18 QA procedures; (2) 10 drawings; (3) 9 sections of the QA Manual; (4) 5 each, letters and purchase orders; (5) 2 each, QA inspection reports, programming sheets, and wire speed correlation charts; and (6) 1 test result form. Also, manufacturing activity was observed in the following areas: (1) machining; (2) welding; and (3) electrical assembly. See items B.1 through B.7 for identified nonconformances.

3. Implementation of 10 CFR Part 21 - It was determined that no effort had been undertaken. During this area of the inspection, three purchase orders were reviewed and one bulletin board observed. See item A for the identified violation.

4. Actions taken by the contractor during this inspection:

   a. Annotated the following drawings to reflect actual conditions: (1) 7003-51053-33, Revision 1, dated April 23, 1982; (2) 7003-51054-23, dated March 31, 1982; and (3) 1023-51153-33, Revision 1, dated April 8, 1982.

ORGANIZATION: NUTHERM INTERNATIONAL, INCORPORATED
MOUNT VERNON, ILLINOIS

REPORT NO.: 99900779/82-01	INSPECTION RESULTS:	PAGE 5 OF 5

b. Initiated the following Quality Assurance Procedures Nos.: (1) 521 - Automatic Wire Feeder Dial vs. Wire Speed Calibration; (2) 618 - Element Installation; and (3) 619 - Element Installation.

c. Invoked 10 CFR Part 21 on the following Purchase Orders: Nos.: (1) 1089-21; (2) 1114-42; and (3) 1123-22.

d. Documented the intent to revise and issue the following drawings "as soon as print machine is repaired": (1) 1023-51151-43; (2) 1023-51153-33; and (3) 7003-51054-23.

e. Documented a tentative revision to a procedure regarding control of programming documents and tapes.

ORGANIZATION: D. G. O'BRIEN, INC.
SEABROOK, NEW HAMPSHIRE

REPORT NO: 99900326/82-01	INSPECTION DATE(S) 6/14-17/82	INSPECTION ON-SITE HOURS: 25

CORRESPONDENCE ADDRESS: D. G. O'Brien, Inc.
ATTN: Mr. Donald G. O'Brien
President
One Chase Park
Seabrook, NH 03874

ORGANIZATION CONTACT: Mr. E. Colen, QA Manager
TELEPHONE NUMBER: (603) 474-5571

PRINCIPAL PRODUCT: Electrical Penetrations

NUCLEAR INDUSTRY ACTIVITY: The nuclear output of this company is 12% based on sales.

ASSIGNED INSPECTOR: R E Oller — 7-20-82
R. E. Oller, Reactive & Components Program Section, (R&CPS) — Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes — 7-23-82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: Change control; equipment calibration; procurement document control; and procurement source selection.

PLANT SITE APPLICABILITY:

McGuire Station, Units 1 and 2; Dockets 50-369 and 50-370.

ORGANIZATION: D. G. O'BRIEN, INC.
SEABROOK, NEW HAMPSHIRE

REPORT NO: 99900326/82-01	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Change Control - The inspector reviewed two sections of the vendor's QA manual which were applicable to changes in design and manufacturing documents.

   To verify that changes in design and manufacturing documents for electrical penetrations were controlled and documented, a review was made of: five D. G. O'Brien procedures; change control documents in a record package consisting of engineering orders, engineering change orders, procedure approval and revision sheets, revision cover sheets for procedures, and revision status of sheets; an engineering change request log; ten engineering change requests; an Engineering Change Order (ECO) for an inprocess airlock penetration; an ECO for a PT procedure change on a traveler, and ten Engineering Orders contained in a log book for various nuclear orders.

   Within this area, no nonconformances or unresolved items, with regard to the NRC and the QA program requirements, were identified.

2. Equipment Calibration - The inspector reviewed Section 10.0 "Control of Measuring and Test Equipment" of the (DGO) QA manual, and observed the calibration status of numerous measuring and test gages.

   To verify that the above observed inspection, test and other measuring devices used in activities affecting quality are controlled and calibrated on a scheduled basis, and the results documented in accordance with written procedures, a review was made of: a general calibration procedure; calibration history cards and/or certificates of calibration for 20 mechanical inspection gages and 21 electrical and mechanical test instruments and gages, and a calibration record log for employee-owned gages.

ORGANIZATION: D. G. O'BRIEN, INC.
SEABROOK, NEW HAMPSHIRE

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Within this area, no nonconformances or unresolved items, with regard to the NRC and the QA program, were identified.

3. Procurement Document Control - The inspector reviewed Section 2.0 of the DGO QA manual which was applicable to procurement documents.

   To verify that procurement documents are controlled in accordance with written procedures, suitably include or referance necessary requirements for procurement of materials, equipment, and services, and require subcontractors to provide an appropriate QA program, a review was made of: two DGO procedures, and records of seven QA and engineering-approved nuclear purchase requisitions and the related purchase orders.

   Within this area, no nonconformances or unresolved items, with regard to the NRC and the QA program requirements, were identified.

4. Procurement Source Selection - The inspector reviewed Section 2.0 of the DGO QA manual which was applicable to procurement source selection.

   To verify that procurement source selections are controlled and documented, and that evaluation of subcontractors includes such measures as: onsite survey; acceptance based on the subcontractors being a holder of a valid and applicable ASME authorization; or acceptance based on a history of satisfactory performance, a review was made of: a DGO procedure controlling QA audits and vendor qualifications; a nuclear code qualified vendor list and a non-nuclear qualified vendor list; two vendor audit files; and a record of vendor analysis for 1981.

   Within this area, no nonconformances or unresolved items, with regard to the NRC and the QA program requirements, were identified.

ORGANIZATION: PACIFIC AIR PRODUCTS COMPANY
SANTA ANA, CALIFORNIA

REPORT NO: 99900769/82-02	INSPECTION DATE(S) 7/12-15/82	INSPECTION ON-SITE HOURS: 26

CORRESPONDENCE ADDRESS: Pacific Air Products Company
ATTN: Mr. L. R. Hess
President
3133 Harvard Blvd.
Santa Ana, CA 92704

ORGANIZATION CONTACT: Mr. T. Conlon, Manager, Quality Assurance
TELEPHONE NUMBER: (714) 557-1710

PRINCIPAL PRODUCT: Air Control Equipment

NUCLEAR INDUSTRY ACTIVITY: 75% based on 1981 sales.

ASSIGNED INSPECTOR: R. E. Oller — 8-10-82
R. E. Oller, Reactive & Component Program Section (R&CPS) — Date

OTHER INSPECTOR(S):

APPROVED BY: I Barnes — 8-12-82
I Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and 10 CFR Part 21.

B. SCOPE: Status of previous inspection findings; equipment calibration; nonconformances and corrective action; internal audits; and 10 CFR Part 21.

PLANT SITE APPLICABILITY:

Rancho Seco - Docket No. 50-312
Nine Mile Point - Docket No. 50-410
Clinton Unit 1 - Docket No. 50-461

ORGANIZATION: PACIFIC AIR PRODUCTS COMPANY
SANTA ANA, CALIFORNIA

REPORT NO: 99900769/82-02	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and paragraph 2.3 of QA Manual Procedure 12.0, Revision 1, the date of the last calibration was not shown on sticker labels attached to several micrometers and calipers, and neither the last calibration date nor the calibration due date were legible on the label attached to the "Porto-Lab" testing console.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and paragraph 2.6 of the QA Manual Procedure No. 12.0, Revision 1, certain micrometers and calipers were stored loose and unprotected among other tools in a portable tool box.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and paragraph 3.1 of the QA Manual Procedure No. 12.0, Revision 1, a broken air pressure gage was not tagged to prevent its inadvertent use.

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and paragraph 5.3 of the QA Manual Procedure 15.0, Revision 0, two completed nonconformance reports (i.e., No. 6291-1, dated March 23, 1982, and No. 6351-1, dated May 10, 1982) were not signed in the "Final Review" signature space as evidence of review by QA.

5. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and paragraph 2.2 of the QA Manual Procedure No. 18.0, Revision 2, an internal audit of the entire QA program had not been performed since July 1, 1981.

6. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and paragraph 3.1 of the QA Manual Procedure 18.0, Revision 2, forms other than the QA manual exhibit forms were being used to document internal audits.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Nonconformance A (82-01): Failure by receiving inspectors to properly tag shipments of galvanized sheet steel with green accepted tags as required by the QA Manual Procedure No. 10.0.

ORGANIZATION: PACIFIC AIR PRODUCTS COMPANY
SANTA ANA, CALIFORNIA

REPORT NO: 99900769/82-02	INSPECTION RESULTS:	PAGE 3 of 4

The inspector verified that, in accordance with the vendor's response letter dated May 7, 1982, green acceptance tags are now being maintained on the racks which support the sheets of steel. In addition, the top sheet of each stack is identified with the PO number, heat number, size, and quantity using indelible ink. The QA procedure, dated November 12, 1981, covering the unloading and marking of steel plate, sheet, and shapes, is being reemphasized to the inspection personnel.

2. (Closed) Nonconformance B (82-01): Failure by the Chief Engineer to assure that design drawings contained correct and adequate application of design criteria, as required by the QA Manual Procedure No. 3.0.

   The inspector verifed that, in accordance with the vendor's response letter dated May 7, 1982, a procedure, "QA Procedure 3-82" was issued on May 20, 1982, which provided for the required use of an engineering checklist, effective June 2, 1982. Review of a completed checklist for the Rancho Seco order, Specification M13.14, verified that the above procedure is being implemented.

3. (Closed) Nonconformance C (82-01): Failure by the in-process inspector to tag a nonconforming actuator mounting bracket which contained cracks at the end of the bend.

   The inspector verified that, in accordance with the vendor's response letter dated May 7, 1982, 100% inspection of formed items is being performed and any brackets found to contain cracks are being tagged with a blue hold tag. In addition, a memorandum dated May 7, 1982, was issued by the Director of Quality Assurance, which required rejection of all cracked material. Review also verifed that a Nonconformance Report No. 5445-1, was issued on February 10, 1982, to document the original defective bracket.

E. OTHER FINDINGS OR COMMENTS:

1. Equipment Calibration: The inspector reviewed Procedure 12.0, "Control of Measuring and Test Equipment" of the vendor's QA Manual, and observed the calibration status of numerous measuring and testing devices. To verify that the above observed inspection, test, and other measuring devices, used in activities affecting quality, are controlled and calibrated on a scheduled basis, and the results documented in accordance with written procedures, a review was made of: the Instrument Calibration Log record for 18 devices; certificates of calibration and procedures provided by 5 subvendors; and the PAPCO's Approved Vendor List.

   Within this area, three nonconformances with NRC and QA program requirements were identified. (See paragraph B.)

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2. Nonconformances and Corrective Action: The inspector reviewed Procedure No. 15.0, "Nonconforming Materials, Parts or Components," and No. 16.0, "Corrective Action," of the vendor's QA Manual.

   To verify that nonconforming items are reviewed and accepted, rejected, repaired, or reworked, and that conditions adverse to quality, including the cause, are promptly identified and corrected, a review was made of: the log of nonconformance reports for the period of January 8, 1980, through July 9, 1982; 10 nonconformance reports; 5 shop production order travelers; 10 corrective action request summary sheets; and 9 corrective action requests.

   Observations were made in the shop of damper parts identified as nonconforming by attached blue "Hold . . . ." tags.

   Within this area, one nonconformance with NRC and QA program requirements was identified. (See paragraph B.)

3. Internal Audits: The inspector reviewed Procedure No. 2, "Quality Assurance Program," No. 18.0, "Audits," and No. 18.1, "Quality Audit Training Program," of the vendor's QA manual.

   To verify that planned periodic audits of all aspects of the QA program are performed in accordance with written procedures or checklists by qualified personnel, the results are documented and reviewed by management, and followup action is taken where indicated, a review was made of: the report of the annual internal audit performed on July 1, 1981; audit schedules for 1981 and 1982; four QA manual exhibits which are required to be used to document internal audits; various checklist records of past audits; a management review memorandum dated December 11, 1981; and certificates of qualification for seven audit personnel.

   Within this area, two nonconformances with NRC and QA program requirements were identified. (See paragraph B.)

4. 10 CFR Part 21: The inspector reviewed Procedure No. 15.1, "10 CFR Part 21-Reporting of Substantial Safety Hazard Defects and Noncompliances," of the vendor's QA manual, to verify that adequate documented measures are available to meet the reporting requirements of 10 CFR Part 21.

   Observation was made of posted documents required by 10 CFR Part 21.

   Within this area, no violations to 10 CFR Part 21 were identified.

ORGANIZATION: PACIFIC PUMPS DIVISION
HUNTINGTON PARK, CALIFORNIA

REPORT NO: 99900063/82-01	INSPECTION DATE(S) 4/20-22/82	INSPECTION ON-SITE HOURS: 17

CORRESPONDENCE ADDRESS: Pacific Pumps Division
ATTN: Mr. D. J. Moyer
Manager, Quality Assurance
5715 Bickett Street
Huntington Park, CA 90255

ORGANIZATION CONTACT: Mr. D. J. Moyer, Quality Assurance Manager
TELEPHONE NUMBER: (213) 588-2203

PRINCIPAL PRODUCT: Nuclear Pumps

NUCLEAR INDUSTRY ACTIVITY: Current activity is limited to replacement and/or spare parts.

ASSIGNED INSPECTOR: _____ _____
for L. E. Ellershaw, Reactive & Components Program Section (R&CPS) Date

OTHER INSPECTOR(S):

APPROVED BY: _____ _____
I. Barnes, Chief, R&CPS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was conducted as a result of linear indications being observed in the intermediate covers of safety injection pumps furnished to Texas Utilities Generating Company's Comanche Peak Steam Electric Station, Units 1 and 2.

PLANT SITE APPLICABILITY:

50-445 and 50-446

ORGANIZATION: PACIFIC PUMPS DIVISION
HUNTINGTON PARK, CALIFORNIA

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A. VIOLATIONS:

None

B. NONCONFORMANCES:

Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Visual Inspection Procedure No. 037-2-0030-0, intermediate cover castings with visible linear indications well in excess of the allowable 1/16" (some being 1" or greater) were accepted by receiving inspection, processed through manufacturing, final inspected, and assembled into safety injection pumps which were subsequently furnished to Texas Utilities Generating Company's Comanche Peak Steam Electric Station, Units 1 and 2.

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

Texas Utilities Generating Company (TUGCO) notified the NRC Resident Inspector on April 15, 1982, of a potential 10 CFR Part 50.55(e) Construction Deficiency Report regarding cracks being found in the multi-vane diffusers in the number one safety injection (SI) pump (Serial No. 51928) for Comanche Peak Unit 2, during a tear-down inspection by site QC personnel. The pump manufacturer was identified as Pacific Pumps Division (PPD).

For clarification of part nomenclature, PPD's drawings identified these parts as Intermediate Covers.

The tear-down inspection was made because this pump was being moved to Unit 1 to replace SI pump Serial No. 51667, which had been returned to PPD due to detected rubbing sounds.

The NRC inspector visited the Comanche Peak site on April 16, 1982, to observe the cracks. Each intermediate cover exhibited one or more cracks, nearly all of which appeared to extend through the web and back from the outside diameter (OD) by as much as 1". The OD is a machined surface and the cracks were clearly visible.

During the visit, site QC personnel removed the casing from SI pump Serial No. 51929, and similar cracks were observed in these intermediate covers. (Note: there are 10 intermediate covers in these SI pumps, one of which is welded to the discharge diffuser.)

During the visit to PPD, the NRC inspector viewed the intermediate covers from the returned SI pump, Serial No. 51667, which had been disassembled by PPD. Again, cracks were observed.

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HUNTINGTON PARK, CALIFORNIA

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Discussions were held between PPD and their customer (Westinghouse Electric Corp.) regarding the use of two similar SI pumps being held in storage as possible replacements for two of the Comanche Peak pumps. The two pumps in storage had originally been manufactured for a site which was subsequently cancelled.

The two pumps, Serial Nos. 51649 and 51650, were returned to PPD from storage, disassembled, and inspected. The intermediate covers exhibited some cracks, none of which were as severe as those already observed.

A review of the associated documentation for the Comanche Peak SI pumps was conducted. It was determined that the intermediate cover castings were supplied by Quali-Cast Corporation and the material is ASTM A-296 CA 6NM. The purchase specifications, incorporated into purchase orders dated April 26, 1976, and January 19, 1977, required visual inspection by the foundry, using MSS SP-55 as the visual inspection acceptance standard. MSS SP-55 does not allow linear indications. A review of Quali-Cast Corporation's Material Test Report & Data Sheets for these castings dated April 8 and May 6, 1977, showed the castings to have been visually and dimensionally inspected, and weld repairs were examined by the magnetic particle method after postweld heat treatment.

The castings used in the Comanche Peak SI pumps were received at PPD on April 19 and May 17, 1977. Review of the Receiving Acceptance Records showed that the castings were accepted on April 23 and May 18, 1977, after the identity was verified and visual inspection performed in accordance with Procedure No. 037-2-0030, Revision 0.

A review of the Route Sheets associated with these castings revealed that all subsequent machining, inspection, and assembly operations were signed/stamped and dated. All operations were complete as of October 31, 1977. During the manufacturing process, Rejected Material Reports (RMR) were generated which addressed rework of certain dimensions and weld repairs due to porosity and cracks, primarily in the vanes. The RMR's showed that all rework and repairs were performed and subsequently accepted.

After assembling the pumps and running performance tests, the Manufacturer's Data Reports, Form NPV-1, were filled out and dated as follows: Pump Serial No's. 51667 and 51668, 10/19/77; pump Serial No. 51928, 11/30/77, and pump Serial No. 51929, 12/28/77. The pumps were then shipped to the site. PPD has provided a total of 53 SI pumps to Westinghouse Electric Corporation; 24, 3"-11 stage and 29, 3"-10 stage. All of the 11 stage pumps and 24 of the 10 stage pumps were supplied for domestic commercial nuclear sites. There are a total of 501 intermediate cover castings in these pumps, all of which were supplied by Quali-Cast Corporation.

ORGANIZATION: PARSONS PEEBLES-ELECTRIC PRODUCTS, INCORPORATED
CLEVELAND, OHIO

REPORT NO.: 99900772/82-01	INSPECTION DATE(S) 3/23-26/82	INSPECTION ON-SITE HOURS: 25.5

CORRESPONDENCE ADDRESS: Parsons Peebles-Electric Products, Incorporated
Subsidiary of Northern Engineering Industries, Ltd., of England
ATTN: Mr. J. V. Pospisil, Manager-Engineering
1725 Clarkstone Road
Cleveland, OH 44112

ORGANIZATIONAL CONTACT: Mr. J. V. Pospisil, Manager-Engineering
TELEPHONE NUMBER: 216/481-1500

PRINCIPAL PRODUCT: Engine driven alternating current generators and controls, and pump motors.
NUCLEAR INDUSTRY ACTIVITY: Currently working on two orders - Hope Creek and Rancho Seco.

ASSIGNED INSPECTOR: W. E. Foster — 6/11/82
W. E. Foster, Reactive and Components Program Section (R&CPS) — Date

OTHER INSPECTOR(S):

APPROVED BY: J. T. Conway for — 6-11-82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21; and Appendix B of 10 CFR Part 50.

B. SCOPE: This inspection was conducted as a result of the issuance of a 10 CFR Part 21 report pertaining to improper application of a Westinghouse Type ECT current transformer in the parelleling circuit of emergency diesel generator static exciter voltage regulator subsystems. The report indicated that the deficient hardware had been supplied to the following nuclear power stations:

PLANT SITE APPLICABILITY: Dockets: 50-413/414; 50-528/529/530/592/595; 50-460/513; 50-498/499; and 50-329/330.

ORGANIZATION: PARSONS PEEBLES-ELECTRIC PRODUCTS, INCORPORATED
CLEVELAND, OHIO

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SCOPE: (Cont.)

(1) Catawba; (2) Palo Verde; (3) Washington Public Power Supply System, Units 1 and 4; (4) South Texas; and (5) Midland.

Additionally, the following programmatic areas were inspected: (1) initial management meeting; (2) initial quality assurance program; (3) manufacturing process control; (4) change control; and (5) implementation of 10 CFR Part 21.

A. VIOLATIONS:

Contrary to Sections 21.6 and 21.51(b) of 10 CFR Part 21:

a. Posting of 10 CFR Part 21, Section 206 of the Energy Reorganization Act of 1974, adopted procedures, or an appropriate notice had not been accomplished.

b. Records of evaluation had not been prepared for the current transformer that failed to meet the specification.

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 7.5 of Section 7, dated June 24, 1981, of the Quality Assurance Manual (QAM), documentary evidence that the Prototype Transformer, Part No. CD-1408, conformed to procurement requirements, drawings, and specifications had not accompanied the item; nor had a shortage form been initiated and the item retained in receiving. This prototype transformer is the replacement for the noncompliant Westinghouse current transformer.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and paragraph 10.3 of Section 10, dated June 24, 1981, of the QAM:

   a. Inspection operations/instructions had not been reflected on the shop traveler or job tickets for Manufacturing Order Traveler No. (17) 200 18107512-513; Drawing Nos. B-69294-5, CDL-11183; Stator Coils.

b. Results of inspection had not been recorded on the following travelers, for materials that had been processed past the inspection points; Manufacturing Order Traveler Nos.: (2) 100 17707372; Drawing Nos. D-67453E "W", C-34231A-4; Stator Punching; Operation Nos. 2 and 5; (51) 200 18107512-513; Drawing No. C-69890A-1; 16-inch Diameter Slip Ring; Operation No. 3; (111) 200 18107512-513; Drawing No. C-69591A-4; Brush Stem Support Bracket; Operation No. 5.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and Inter-Company Correspondence, dated February 4, 1982, regarding Manufacturing Order Traveler No. (2) 100 17707372; Drawing Nos. D-67453E "W", C-34231A-4; Stator Punching:

   a. The approval to run space of the Punch Press Quality Assurance Log (PPQAL) had not been signed and dated despite completion of verifying the adequacy of the first article and the operation's having started.

   b. The period when the operation was not running had not been indicated on the PPQAL despite the operation's being stopped due to equipment problems.

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and paragraphs 6.3 and 6.4 of Section 6, dated June 24, 1981, of the QAM:

   a. The following revised product travelers had not been reviewed and approved by the Manufacturing Manager, prior to distribution, as evidenced by the lack of signature or other indication; Manufacturing Order Travelers Nos.: (19) 200 18107512-513, dated January 15, 1982; Drawing Nos. B-69294-5, WDL 11183; and (17)200 18107512-513, dated January 14, 1982; Drawing Nos. B-69294-5, CDL 11183.

   b. The latest revisions to the following QA documents had not been reviewed and approved by the Quality Assurance Manager, prior to distribution, as evidenced by approval signatures that predate the revisions; EQ Nos.: 2.2.2, dated May 16, 1978; 2.2.4, dated June 7, 1978; 2.5.1B, dated June 5, 1979; and 2.12, dated February 12, 1979. It was noted that Section 6, dated August 2, 1977, also contained the identical requirement.

ORGANIZATION: PARSONS PEEBLES-ELECTRIC PRODUCTS, INCORPORATED
CLEVELAND, OHIO

REPORT NO.: 99900772/82-01	INSPECTION RESULTS:	PAGE 4 of 5

C. UNRESOLVED ITEM:

The inspector observed that Drawing No. A-48048-21, Revision 3, dated January 27, 1982, was in use in the Small Stacking Area, to accomplish the task identified on Manufacturing Order Traveler No. (15) 600 1812522. The drawing had been marked with a red felt-tip pen in several locations with no indication of the person responsible for the marking.

Subsequent to inquiry, the inspector was informed that there was no procedure addressing marked prints. As a result, the inspector could not determine the validity of using marked prints.

D. OTHER FINDINGS OR COMMENTS:

1. Follow up on a Request from Headquarters - The request was initiated as a result of a 10 CFR Part 21 report that related to improper application of a current transformer, Westinghouse Type ECT. Improper application was the result of selecting a transformer with appropriate current rating without giving sufficient consideration to the ambient temperature at the location of its installation. Inadequate design verification compounded the problem.

   Planned replacement of the noncompliant transformers is satisfactory. The transformer has been redesigned for use at the ambient temperature of installation location and another source of supply has been selected. A prototype has been received and subjected to a performance test which is the first of a series of planned tests. Documentation of activities associated with the prototype transformer did not provide assurance that design control was adequate; i.e., (1) the device did not go through receiving inspection, resulting in a lack of documentation, (2) performance test data did not reflect a review for acceptance analysis and evaluation, and (3) performance test data did not provide accept/reject criteria. Additionally, it was determined that records of evaluation had not been prepared.

   As a result of the foregoing, one violation and two nonconformances were identified.

2. Programmatic Areas Inspected - This area of the inspection related to: (1) initial management meeting; (2) initial quality assurance program; (3) manufacturing process control; (4) change control; and (5) implementation of 10 CFR Part 21. This activity resulted in one violation and three nonconformances. While only four QA documents (EQ Specifications) were identified in the nonconformance, the majority were in that category.

ORGANIZATION: PARSONS PEEBLES-ELECTRIC PRODUCTS, INCORPORATED
CLEVELAND, OHIO

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The company is currently under the direction of a management committee while the search for a general manager continues. The QA Manager went to work for the company on January 3, 1982.

The company also furnishes pump motors for nuclear generating stations. It could not be determined that they were for Class IE application.

ORGANIZATION: PULLMAN POWER PRODUCTS
PARAMOUNT, CALIFORNIA

REPORT NO.: 99900077/82-01	INSPECTION DATE(S) 6/14-18/82	INSPECTION ON SITE HOURS: 32

CORRESPONDENCE ADDRESS: Pullman Power Products
Division of Pullman, Inc.
ATTN: Mr. H. W. Owen, Plant Manager
14507 South Paramount Boulevard
Paramount, California 90723

ORGANIZATION CONTACT: D. E. Obrion, Quality Assurance Manager
TELEPHONE: (213) 531-1370

PRINCIPAL PRODUCT: Nuclear Piping Subassemblies

NUCLEAR INDUSTRY ACTIVITY:
The Paramount plant nuclear piping fabrication represents approximately 2% of the plant workload.

ASSIGNED INSPECTOR: H. W. Roberds, Reactive and Component Program Section (R&CPS) — Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B

B. SCOPE: Manufacturing process control, welding material control, weld procedure specifications, joint fitup and welding, and NDE personnel qualification.

PLANT SITE APPLICABILITY:

Palo Verde Nuclear Station, Docket No. 50-530

ORGANIZATION: PULLMAN POWER PRODUCTS
PARAMOUNT, CALIFORNIA

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A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Manufacturing Process Control - The inspector reviewed five sections of the Pullman Power Products, Paramount Facility, Quality Assurance Manual, which were applicable to control of material, operations, inspections, and test of the nuclear piping subassembly throughout the fabrication cycle.

   To verify that fabrication and inspections were controlled and documented in accordance with requirements, a review was made of four process sheets for main steam piping for the Palo Verde Nuclear Generating Station.

   Within this area, no nonconformances to NRC, customer, or QA program requrements were identified and no unresolved items were noted.

2. Welding Material Control - The inspector reviewed Document No. VIII-3P, "Control of Nuclear Welding Material Prior to Fabrication," and Document No. VIII-4P, "Control of Nuclear Welding Material During Fabrication."

   Observations were made of the welding wire, flux, and coated rod storage area, and hot ovens maintained in the weld material issue crib. To verify that weld material issuance was controlled and documented, discussions were held with the personnel performing the material issuance and a review of records of weld rod requisition slips for process sheet F-712 and the list of approved welding materials for job number 2825.

   Within this area, no nonconformances to NRC, customer, or QA program requirements were identified and no unresovled items were noted.

3. Weld Procedure Specifications - The inspector reviewed Document No. VI, "Control of Welding Procedures Assigned to Fabrication Drawings" and Document No. IX-10P, "Repairs of Base Material Defects."

ORGANIZATION: PULLMAN POWER PRODUCTS
PARAMOUNT, CALIFORNIA

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To verify that weld procedure specifications (WPS) were controlled and in compliance with Section IX of the ASME Code, the inspector selected four WPS form drawings for review. Each WPS was reviewed to assure that all essential variables and applicable nonessential variables were listed and the WPS was in compliance with the supporting procedure qualification record.

Within this area, no nonconformances to NRC, customer or QA program requirements were identified and no unresolved items were noted.

4. Joint Fitup and Welding - The inspector reviewed Section IX of the QA Manual, "Control of Special Process" and Document No. IX - 1OP, "Repair of Base Material Defects." To ascertain that joint fitup and welding is controlled in accordance with the QA Program requirements, the inspector reviewed and observed the following: (1) review of four process sheets for identification of welder/weld operator and weld material; (2) observation of four welding machines for current calibration stickers; (3) observation of weld procedure stipulated on the drawings at four weld stations; (4) review of calibration records; and (5) observation of current and voltage during GTAW process welding.

   Within this area, no nonconformances to NRC, customer or QA program requirements were identified and no unresolved items were noted.

5. NDE Personnel Qualification - The inspector reviewed Section IX, paragraph 9.3 of the QA Manual, "Nondestructive Examination".

   To verify that NDE personnel were trained, qualified, and certified in accordance with requirements, a review was made of the procedures governing these activities and current records consisting of: NDE education and experience, written SNT-TC-1A examination, Certification history including current eye examinations for two NDE level II technicians for liquid penetrant and magnetic particle examination.

   Within this area, no nonconformances to NRC, customer or QA program requirements were identified and no unresolved items were noted.

ORGANIZATION: RELIANCE ELECTRIC COMPANY
SYSTEMS & CONTROL DIVISION
STONE MOUNTAIN, GEORGIA

REPORT NO.: 99900761/82-01	INSPECTION DATE(S) 3/8-12/82	INSPECTION ON-SITE HOURS: 31

CORRESPONDENCE ADDRESS: Reliance Electric Company
Systems & Control Division
ATTN: Mr. R. Morrow, Manager, Quality Assurance
4900 Lewis Road
Stone Mountain, Georgia 30083

ORGANIZATIONAL CONTACT: Mr. R. Morrow, Manager, Quality Assurance
TELEPHONE NUMBER: (404) 938-4888

PRINCIPAL PRODUCT: Control Board Panels

NUCLEAR INDUSTRY ACTIVITY: Approximately 10% of Reliance Electric Company's work is for the commercial nuclear industry. Current work is for Georgia Power Co.'s Alvin W. Vogtle, Jr. Nuclear Plant, Unit 1 and 2, and modification of panels for Texas Utilities Generating Company's Comanche Peak, Unit 1 and 2.

ASSIGNED INSPECTOR: for L. E. Ellershaw, Reactive & Component Program Section (R&CPS) — Date: 6/8/82

OTHER INSPECTOR(S): E. Hines, R&CPS

APPROVED BY: I. Barnes, Chief, R&CPS — Date: 6/8/82

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B

B. SCOPE: This inspection was made as a result of: (1) allegations received by NRC's Region II office regarding control panels fabricated and shipped to Waterford Generating Station, Unit 3, and pertaining to the use of uncalibrated welding power source meters and uncertified welders in the manufacture of these panels, shipping of known defective welds, wiring not

(cont. on next page)

PLANT SITE APPLICABILITY: (1) 50-382
(2) 50-454, 50-455, 50-456, 50-457, 50-329, 50-330, and 50-483

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SCOPE: (Cont.)

in accordance with IEEE Standards, failure to correctly identify and document part numbers/serial numbers of component parts; and (2) an NRC Region III request to inspect specific control panel fabricators due to defective welds identified in panels supplied to Byron Station, Unit 1 and 2, Braidwood Station, Unit 1 and 2, Midland Plant, Unit 1 and 2, and Callaway Plant, Unit 1. The areas selected for this inspection included: welding process control; welding procedure specifications; qualifications of inspection personnel; and control of nonconformances and corrective actions.

A. VIOLATIONS:

Contrary to paragraph 21.6 of 10 CFR Part 21, neither Section 206 of the Energy Reorganization Act of 1974 nor current copies of 10 CFR Part 21 were posted on the premises.

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and QA Manual Section 16, reports defining problems found during periodic reviews to identify significant conditions, including causes of the conditions and the corrective actions to be taken, had not been made from March 1976 until January 1982.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and AWS D1.1 Section 5, welding procedure specification (WPS) no. 6, Revision 3 dated May 16, 1978, a gas metal arc welding procedure, permitted changes to essential variables which were in excess of that which is allowed, without establishing a new procedure by qualification. The following essential variable changes were permitted by the WPS:

   a. A change of more than 10% above or below the specified mean amperage;

   b. A change of more than 7% above or below the specified mean arc voltage; and

   c. A decrease of 10% or more in the flow rate of shielding gas or mixture.

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3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and QA Manual Section 5, the NRC inspector observed gas metal arc welding (GMAW) being performed on auxiliary relay panels for Georgia Power Company's Alvin W. Vogtel, Jr. Nuclear Plant, which was not in accordance with the Welding Procedure Specification in that:

   a. Two different welders were using 135 and 140 amps, respectively, while the WPS specified 110-115 amps

   b. Two different welders were using a gas flow rate of 30 CFH, while the WPS specified 22-24 CFH

   It was further observed that an Argon flow meter was being used to monitor the flow rate of carbon dioxide gas.

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and ASME Code Section IX, the NRC inspector observed in-process GMAW on auxiliary relay panels for Georgia Power Company's Alvin W. Vogtle, Jr. Nuclear Plant in which three different welders, qualified only in the upward progression for vertical welding, were welding in the downward progression while making vertical welds.

5. Contrary to Criterion V of Appendix B to 10 CFR Part 50, AWS D1.1, ASME Code, and QA Manual Section 10, the NRC inspector observed the following on a shutdown transfer panel for Texas Utilities Generating Company's Comanche Peak Steam Electric Station, Unit 2, in which the welds had been accepted by QA/QC as shown on the Fabrication Inspection Report dated March 3, 1982:

   a. Excessive weld spatter, some of which was easily removed by hand;

   b. Lack of fusion on several welds; and

   c. Weld wire remnants, fused and protruding from completed welds, ranging from 1/2" up to 4" in length.

C. UNRESOLVED ITEMS:

None

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SYSTEMS & CONTROL DIVISION
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D. OTHER FINDINGS OR COMMENTS:

1. Follow-up Inspection Regarding Allegations

a. Uncalibrated welding power sources - A review of the calibration records for welding power sources revealed certifications were on file from two different calibration subcontractors. The certifications, showing that calibration had been accomplished, were dated 7-9-74, 6-9-75, 9-8-76, 2-1-79, 8-11-79, 1-24-80, and 6-26-81. There were no certifications for the period 9/8/76 through 2/1/79 because Reliance Electric Company (REC) performed the calibrations themselves. A card for each welding power source is maintained, with pertinent calibration information recorded, relative to REC's calibration activities.

b. Uncertified welders - A review of welders' qualification records revealed that the five currently employed welders have been qualified in accordance with ASME Section IX requirements since at least November 7, 1978. In addition, two welders have also been qualified in accordance with AWS D1.1 since, at least, October 31, 1975. Former welders' qualification records dated back to 1970.

c. Shipping of known, defective welds - An inspection of welding activities demonstrated that current welding process controls and inspection were not consistent with QA program requirements,as evidenced by Nonconformance B.2, B.3, B.4 and B.5.

d. Wiring not in accordance with IEEE Standards - REC customer design documents delineate the IEEE standards. REC passes these requirements on to their suppliers, who are surveyed/ audited on a triannual basis, as a minimum. A review of REC audit records and purchase orders pertaining to six wiring subcontractors confirmed this. In addition 10 CFR Part 21 is also imposed on subcontractors if it has been imposed on REC, or if REC considers the procured items as being safety related.

e. Failure to calibrate component parts - The NRC inspector was unable to substantiate this specific allegation in that there was no in-process testing of safety related components being performed.

However, a review of wiring inspection reports, electrical test inspection reports, pneumatic test inspection reports and final inspection reports was performed on the Waterford control board panels. The inspection reports reflected adherence to the QA Program commitments.

f. Failure to correctly identify and document part numbers/serial numbers of component parts - This area was inspected by reviewing the Summary of Materials for selected panels supplied to Comanche Peak, Unit 2. The traceability of specific switches, taken from the Summary of Materials, was established by reviewing the REC purchase orders to the subcontractors, the REC receiving inspection reports, the subcontractors' packing releases, and the certificates of conformance.

The alleger stated to the NRC Region II investigator that these allegations were based upon identified QA internal audit findings. Review of internal audit reports by the NRC inspector did not disclose, however, any findings with respect to the allegation subject material. With the exception of the nonconforming conditions identified in regard to welding, no basis was indicated by inspection for the remaining allegation subjects.

2. NRC Region III Request: NRC Region III requested that an inspection be performed at specific control panel fabricators, based on defective welds found in panels supplied by the fabricators to the Byron Station, Braidwood Station, Midland Plant, and the Callaway Plant. In addition to the areas inspected regarding the allegations, the following areas were also selected:

a. Control of Nonconformances and Corrective Actions - Approximately 15 rejection tickets and nonconforming labor tickets were reviewed to determine if the deficient conditions had been corrected and to verify that the corrective actions had been provided. A review of required, formal reports dealing with nonconforming labor tickets was performed and as a result, nonconformance B.1 was identified.

b. Welding Procedure Specifications (WPS) - REC's two WPSs and their procedure qualification records were reviewed. WPS No. 6 is a gas metal arc welding (GMAW) procedure used for AWS D1.1 welding, while WPS No. 7, a GMAW procedure, is an ASME Section IX procedure. Nonconformance B.2 was identified.

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STONE MOUNTAIN, GEORGIA

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c. Welding Process Control - The NRC inspector observed in-process GMAW being performed by three welders, on auxiliary relay panels for Georgia Power Company's Alvin W. Vogtle, Jr. Nuclear Plant. Nonconformances B.3 and B.4 were identified.

d. Qualifications of Inspection Personnel - The qualifications of three welding inspectors, including results of required, annual eye examinations were reviewed. In addition, the NRC inspector observed welds in a shutdown transfer panel being supplied to Comanche Peak, Unit 2, and which had been accepted by a welding inspector. Nonconformance B.5 was identified.

ORGANIZATION: RICHMOND ENGINEERING COMPANY, INC.
RICHMOND, VIRGINIA

REPORT NO: 99900751/82-01	INSPECTION DATE(S) 6/1-3/82	INSPECTION ON-SITE HOURS: 20

CORRESPONDENCE ADDRESS: Richmond Engineering Company, Inc.
ATTN: Mr. F. G. Louthan, Jr.
President
P. O. Box 25189
Richmond, VA 23260

ORGANIZATION CONTACT: C. H. Massengill, Corporate QA/QC Manager
TELEPHONE NUMBER: (804) 644-2611

PRINCIPAL PRODUCT: Pressure Vessels

NUCLEAR INDUSTRY ACTIVITY: Not identified

ASSIGNED INSPECTOR: for H. W. Roberds, Reactive and Component Program Section, (R&CPS) — 7-13-82 Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes, Chief, R&CPS — 7-13-82 Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made as the result of: (1) a 10 CFR Part 50.55(e) report by Duke Power Company relative to unacceptable quality of radiographs of welds for refueling water storage tanks supplied to Catawba Nuclear Station, Units 1 and 2; and (2) the identification of a potential construction deficiency (CDR) by Georgia Power Company of incorrect coating applied to the ID of diesel fuel oil day tanks supplied to Vogtle Unit 2.

PLANT SITE APPLICABILITY: Unacceptable radiographic quality: 50-413 and 50-414, and incorrect coating of diesel fuel oil day tanks: 50-425.

ORGANIZATION: RICHMOND ENGINEERING COMPANY, INC.
RICHMOND, VIRGINIA

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A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Nonconformance (81-01): A hold point had been signed off on weld joint 3 although final acceptance (radiography) was not performed until 1 week later. It was verfied that documentation has been revised to include signoff of radiographic examination on the operational worksheet, and the revised documentation had been sent to customers.

2. (Closed) Nonconformance (81-01): Review of ultrasonic thickness measurements showed that tanks contained heads with thickness below drawing requirements.

   It was verified that the applicable drawings had been revised to reflect the minimum design thickness of the heads, and Section 2 of the QA Manual had been revised to require the development of fabrication drawings which reflect the as-constructed condition.

3. (Closed) Nonconformance (81-01): A 3/16-inch electrode was used to weld joint nos. 1, 6, 9, 11, and 13 rather than the required combination of 1/8-inch and 5/32-inch electrodes.

   It was verified that a nonconformance report had been initiated, and the applicable Weld Procedure Specification had been requalified using a 3/16 electrode. A formal procedure, ES-170, had been issued to define responsibilities for issuance of electrodes in accordance with the applicable weld procedure.

4. (Closed) Nonconformance (81-01): A certified material test report for applicable E7018 electrode was not included in the record package for gas decay tank no. 2320.50.

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It was verified that the applicable material test report was forwarded to the customer to include the test report in his documentation record package, and Section 16 of the QA Manual had been revised to require the Quality Assurance Coordinator to review the final documentation record package for completeness.

5. (Closed) Nonconformance (81-01): Various lengths of leg beam to plate fillet welds were found to be undersized on gas decay tanks at WPPSS site.

   It was verified that calculations had been performed to indicate specific minimum fillet weld size by location, and that drawings had been revised and approved by the customer to reflect the minimum size of fillet welds. A procedure had been initiated and implemented for formal inprocess inspection for monitoring weld configuration and size.

E. OTHER FINDINGS OR COMMENTS:

1. Part 50.55(e) Report - The quality of radiographs of welds for refueling water storage tanks (RWST) fabricated by Richmond Engineering Company (RECO) for Catawba Nuclear Station, Units 1 and 2, does not meet the requirements of Section III of the ASME Code.

   a. As a result of a review of radiographs by Duke Power Company of welds on Catawba Unit 2 RWST, it was disclosed that the majority of radiographs did not meet the quality requirements of the ASME Code. The RWST was erected in the field by RECO, and nondestructive examination was subcontracted to Industrial NDT, Inc. (INDT). The radiographs were interpreted by two INDT Level III examiners, certified by ASNT written examination, and accepted as meeting all the requirements of Section III of the ASME Code. Out of 605 radiographs, 465 were rejected by Duke Power Company and RECO radiographic interpreters for being under the required density of 2.0. The Unit 2 RWST was reradiographed, and 10 radiographs showed indications of unacceptable slag inclusions. RECO repaired the welds and rehydrotested the tank. The rework was completed on January 29, 1982.

   b. The Catawba Unit 1 RWST was erected in the field by RECO, and nondestructive examination was subcontracted to Frochling and Robertson Testing Laboratory (F&R). Radiography was performed by F&R and the radiographs were interpreted and accepted by a F&R Level III examiner, certified by ASNT written examination.

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As a result of the radiographic discrepancies disclosed on the Catawba Unit 2 RWST, RECO personnel reviewed the radiographs on Unit 1 RWST. Out of 608 radiographs, 119 were rejected for being under the density requirements of 2.0. The tank is presently full of water used for system hydrotesting, and the rejected radiographs will be reradiographed when the tank interior is accessible.

To preclude recurrence of the preceding discrepancies, RECO personnel will perform the final review of all radiographs regardless of the qualifications of subcontracted personnel.

2. Potential CDR - Diesel fuel oil day tanks fabricated by RECO for Vogtle Unit 2 had been coated with ENJO type lining instead of the required Carbo Zink 11.

The original Bechtel specification No. X4H04 required the ENJO type coating be applied to the inside of diesel fuel oil day tanks for Vogtle Unit 1 and 2. However, Revision 1 to Specification No. X4H04 on 2/1/79 changed the coating to Carbo Zink 11. The change was incorporated into the manufacturing requirements for Unit 1 tanks which were coated with the Carbo Zink 11, but was not reflected in the manufacturing requirement for Unit 2 tanks which were coated with ENJY type lining. The tank for Unit 2 was returned to RECO. The ENJO type coating was removed and Carbo Zink 11 was applied and inspected on 3/29/82.

To prevent a possible recurrence, RECO has developed a checklist that will identify what manufacturing processes are affected by specification revisions. This checklist will be completed through the present review cycle and will be used as a check during final documentation review to assure all specification changes/revisions have been incorporated into applicable documents.

ORGANIZATION: ROSEMOUNT, INC.
EDEN PRAIRIE, MINNESOTA

REPORT NO: 99900271/82-01	INSPECTION DATE(S) June 7-11, 1982	INSPECTION ON-SITE HOURS: 26

CORRESPONDENCE ADDRESS: Rosemount, Inc.
ATTN: Mr. F. J. Oakley
Vice President, Operations
12001 W. 78th Street
Eden Prairie, MN 55344

ORGANIZATION CONTACT: Mr. G. D. Anderson
TELEPHONE NUMBER: (612) 941-5560

PRINCIPAL PRODUCT: Temperature and pressure instrumentation qualified to IEEE 323 requirements.

NUCLEAR INDUSTRY ACTIVITY: Five to ten percent of total activity is nuclear.

ASSIGNED INSPECTOR: L. B. Parker, Reactive and Component Program Section (R&CPS) — 8/13/82 Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes, Chief, R&CPS — 8/13/82 Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B, and 10 CFR Part 21.

B. SCOPE: This inspection was made in response to: (1) requests by Region II of the Nuclear Regulatory Commission (NRC) to evaluate: (a) a 10 CFR 50.55(e) report by Mississippi Power and Light Company (MP&L) concerning corroded terminal boards on transmitters used at Grand Gulf Nuclear Station (GGNS); (b) a 10 CFR 50.55(e) report by MP&L concerning "O" ring seals on transmitters which do not provide a seal that conforms with the requirements of NUREG-0588 (cont. on next page.)

PLANT SITE APPLICABILITY: Docket Nos. 50-416, 50-417, 50-382, 50-245, 50-336, 50-387, and 50-388.

ORGANIZATION: ROSEMOUNT, INC.
EDEN PRAIRIE, MINNESOTA

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SCOPE: (Cont.)
for Class 1E equipment located inside containment; (2) a report from the NRC Senior Resident Inspector at Millstone Nuclear Station Units 1 and 2, and a 10 CFR 50.55(e) to the NRC Region IV from Waterford Unit No. 3 concerning corrosion degradation of resistance temperature detector (RTD) leads at the terminal block connection in the head of the RTD assembly; and (3) a 10 CFR 50.55(e) report by PP&L concerning a potential diode failure (identified by Rosemount) on the amplifier board of pressure transmitters, Models 1151 and 1152 with output codes A and D at Susquehanna Steam Electric Station. Additionally, the following areas were inspected: (1) status of previous inspection findings; and (2) manufacturing process control.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 4.1.5 of Quality Implementation Procedure (QIP) 21(I), Revision D, dated May 21, 1981, red lines on Inspection Procedure 3799-2, Revision B, dated June 18, 1981, were out-of-date and being used.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 4.1.5.1 of QIP 21(I), Revision D, step 3 of "Nuclear Assembly Operations Sheet," Operation No. 3935-N had been red lined without being initialled or dated.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 4.5.6 of the Industrial Division Quality Assurance Manual, Revision G, dated February 26, 1982, Travel Cards (Form 61024, Revision C) currently used in the final assembly of Model 1153's are not covered by a written procedure.

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 4.2.2 of QIP 21(I), Revision D, the traveller for Part No. 01152-0033-0004, Revision F, for Bill of Material (BOM), Revision A, did not list the revision level of any of the listed process specifications.

5. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and BOM 01153-0259-0052, Revision D, Run Date September 8, 1981 (which requires Process Procedure 01153-3032, Revision D), the Nuclear Traveller for Part No. 01153-0259-0052, Revision E, for BOM, Revision D, required Process Procedure 01153-3034, Revision D, for Operation No. 30, "Form and Serialize."

ORGANIZATION: ROSEMOUNT, INC.
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6. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Step 7 of Tig Center Weld Set-up in Stretch Weld Procedure, 1153-3030, Revision B, dated October 12, 1979, and Step A of Verify Diaphragm Stretch, the standard weld log and the sensor operation log were used to record data instead of the logs identified in the procedure.

7. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 4.2.2 of QIP 21(I), Revision D, the completed Nuclear Traveller for Part No. 01153-0259-0052, Revision E, for BOM, Revision D, does not indicate the six rejected NB52 sensor cells; Serial Nos. 749005, 749015, 749051, 749122, 749169, and 749176.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Unresolved Item (80-01): A determination could not be made as to how the General Electric (GE) Quality Assurance Program had qualified RMT 1152 transmitters to IEEE STD 323-1974.

   Current RMT Product Data Sheet 2235, revised August 1981, states that the 1152 (E output code) transmitters are qualified per IEEE STD 323-1971 and IEEE-344 1975. Also 1151 (E&B output codes) are not nuclear qualified by RMT. This item is closed at RMT, and will be covered in a future inspection at the GE facility.

2. (Closed) Unresolved Item (80-01): RMT requested that the Gilbert Associates, Inc. requirement for 1153 (A output series) transmitters be changed from IEEE STD 344-1975 to IEEE STD 344-1971.

   In August 1980, RMT qualified the 1153 (A output series) transmitters to IEEE STD 344-1975.

E. OTHER FINDINGS OR COMMENTS:

1. Regional Requests:

   a. On April 21, 1982, MP&L reported corroded terminal boards on pressure transmitters, flow transmitters and level transmitters at their GGNS Unit 1. MP&L issued 10 CFR Part 50.55(e) interim report (PRD-82/23) to NRC Region II concerning this problem on May 21, 1982. RMT had no knowledge of this corrosion problem. Bechtel Power Corporation, Gaithersburg, Maryland, will be contacted on this during a future inspection.

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b. On April 21, 1982, MP&L reported that installation of O-ring seals on RMT transmitters did not conform to requirements of NUREG 0588, Class 1E, for components located inside containment at their GGNS Units 1 and 2.

MP&L issued 10 CFR Part 50.55(e) final report for Unit 1 and an interim report for Unit 2 (PRD-82/22) to NRC Region II on May 21, 1982, which stated in part, "The Rosemount transmitters themselves did not contain a deficiency. The deficiency was caused by improper use of a hydrocarbon lubricant on the 'O' rings between the housings and the housing covers. This was done by Bechtel Power Corporation, Gaithersburg, Maryland."

RMT had no knowledge of this 'O' ring deficiency. However, RMT instruction manuals for the 1151, 1152, and 1153 model transmitters contain precautionary paragraphs requiring the use of silicone oil on the 'O' ring. Bechtel Power Corporation, Gaithersburg, Maryland, will be contacted on this problem during a future inspection.

c. Millstone Nuclear Station Senior Resident Inspector identified the degradation of RMT resistance temperature detector (RTD) signals caused by corrosion of the RTD leads at a terminal block connection in the "head" of the RTD assembly (Rosemount Model 104ADA and 104AFC). This same deficiency was also identified in a 10 CFR Part 50.55(e) report by Louisiana Power and Light (LP&L) for their Waterford Unit No. 3.

LP&L had been notified of the deficiency by Ebasco Services, Incorporated, who in turn had been notified by Combustion Engineering, Power Systems, on July 27, 1981.

RMT states the following in a response letter to a NSAC/INPO Significant Event Report (SER): (1) "The RTD design cited in the report is unique to C-E reactors and possibly only Millstone"; and (2) "the RTD terminal lugs are tin plated and the terminal block fittings are copper. We would not expect any interaction between these materials under sealed conditions."

Since this RTD design was unique to C-E reactors, and the NSAC/INPO SER had been sent to CE, RMT considered the SER as notification of the deficiency to the purchasers.

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EDEN PRAIRIE, MINNESOTA

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This RTD design has been discontinued by RMT. C-E reactor RTD designs have been changed to incorporate nickel plated terminal blocks as well as improved connection head design.

RMT has taken adequate corrective action and actions to prevent recurrence.

d. PP&L reported that Rosemount had identified a potential diode failure on the amplifier board of pressure transmitter Models 1151 and 1152 with output codes A and D. RMT determined that this deficiency was caused by moisture entrapment during manufacture of the diode.

RMT traced the lots containing defective diodes and determined all of the defective diodes had been used by their Canadian manufacturing operations in the production of C-1152 transmitters which are not sold in the United States.

RMT has taken adequate corrective action and actions to prevent recurrence.

2. Manufacturing Process Control - Travellers, Quality Implementation Procedures, drawings, engineering change authorizations, assembly operations sheets, traveller cards, bills of material, operation logs, and inspection procedures were examined from the following areas: sensor assembly, electronics assembly, and final nuclear assembly. Nonconformances B.1 through B.7 above were identified in this area of the inspection.

ORGANIZATION: SANDVIK SPECIAL METALS CORPORATION
KENNEWICK, WASHINGTON

REPORT NO.: 99900764/82-01	INSPECTION DATE(S) 4/6-8/82	INSPECTION ON-SITE HOURS: 72

CORRESPONDENCE ADDRESS: Sandvik Special Metals Corporation
ATTN: Mr. J. A. Lindberg
President and General Manager
P. O. Box 6027
Kennewick, Washington 99336

ORGANIZATIONAL CONTACT: K. Bowles
TELEPHONE NUMBER: (509) 586-4131

PRINCIPAL PRODUCT: Nuclear Fuel Tubing

NUCLEAR INDUSTRY ACTIVITY: Nuclear fuel tubing supplier for CE and B&W designed cores and reloads supplied by Exxon.

ASSIGNED INSPECTOR: J. T. Conway /for — 6-22-82
W. M. McNeill, Reactive & Components Program Section (R&CPS) — Date

OTHER INSPECTOR(S): L. E. Ellershaw, R&CPS
J. T. Conway, R&CPS

APPROVED BY: J. T. Conway /for — 6-22-82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and 10 CFR Part 21.

B. SCOPE: This inspection was performed as a result of the receipt by the Nuclear Regulatory Commission of allegations pertaining to quality program implementation and effectiveness. Areas selected for inspection included material identification, manufacturing process control, calibration, NDE control, training, document control and audits.

PLANT SITE APPLICABILITY:

Not Identified.

ORGANIZATION: SANDVIK SPECIAL METALS CORPORATION
KENNEWICK, WASHINGTON

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A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 6.0 in Section 1-6 of the QA Manual:

   a. The following examples were identified where the control of documents was not in accordance with the requirements of Document Control Procedure QA-GA-7, Revision 1:

      (1) The document index pages in Quality Assurance Procedure Manual No. 3 were not the current issue required by paragrph 2.4.

      (2) Superseded procedure revisions were not removed from work locations in accordance with paragraph 6.3; e.g., Quality Assurance Procedure Manual No. 21 contained a superseded revision of Procedure QA-GA-9, a superseded revision of Procedure QA-GA-16 was at the rework station, and a superseded revision of Procedure NDT-UT-10 was at the UT line 4 station.

      (3) Specification Z-075 was not at the rework station, as required by paragraph 5.2.

      (4) Unassigned procedures were found at three work stations (Vacuum Blast-one, Final Inspection-one, Special Products-two), which is contrary to paragraph 5.1.

   b. Procedure QA-GA-23, pertaining to establishment of visual standards, was not listed in the Quality Control Matrix as required by paragraph 0.0 in Section 1, Revision 3, of the QA Manual.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 10.0 in Section 10 of the QA Manual, certain inspections were not being performed in accordance with written instructions, as evidenced by the following examples:

   a. Identity of surface measurement equipment in use was not being documented, although required to be by QA-SP-45, Revision 2, paragraph 4.12.

b. Verification of the digital thermometer used for elevated temperature tensile testing was performed three times in the last 12 days of testing, and not daily as required by Laboratory Procedure 1300-19, Revision 5, paragraph 8.2.

c. Contractile Strain Ratio testing was being performed without the applicable written procedure required by the QA Manual, section 5, paragraph 5.0.j.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 3.1.1 of procedure QA-GA-5, ingots were used but were not identified on the QC 110 form as being acceptable to the customer.

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and QA Manual Section 1-12 and QA procedure QA-GA-15, the following conditions pertaining to calibration were observed:

a. The ultraviolet light, an instrument critical to quality measurement during fluorescent penetrant examination, was neither listed in Appendix I nor were there records to show that its light intensity has been verified.

b. The Weston light meter, which could be used to verify the intensity of the ultraviolet light, was neither listed in Appendix I nor were there records to show if it had been calibrated.

c. Ultrasonic Test (UT) 3D standard no. 2018, being used as a reference for inside and outside tube diameter measurements, did not have a calibration record card available.

d. UT standard F-2002-3, used for flaw detection, could not be located, and the calibration record card did not identify the standard as being out of service.

5. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Quality Assurance Procedure No. NDT-PT-1, ZR-10 emulsifier was being used during fluorescent penetrant examination rather than the required ZR-1 emulsifier.

6. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 1.2 in Section 1-1 of the QA Manual, there was no evidence or documentation of some QA training. For example, six out of seven QA files for inspectors did not contain the Job Training Progress Record required by paragraph 3.4 of QCI-4, Revision 0, on inspection activities, and there was no

evidence that the seven inspectors had received indoctrination and training in QA activities in general. In addition, the QA files for six exempt employees in the QA organization contained no documented evidence of QA indoctrination and training.

7. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 2.0 in Section 1-17 of the QA Manual, certain records were not being retained for 10 years, in that superseded revisions for two laboratory procedures, 1300.19 and 1300.20, and process specification Z431 were missing from the historical files.

8. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraph 0.1 in Section 1-0 of the QA Manual and ANSI N45.2, the audit system was not comprehensive in that internal audits were not scheduled to be performed in all applicable areas. Examples of areas not addressed are procurement, control of materials, QA records, nonconforming materials, and indoctrination and training.

9. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraphs 2.1, 2.4, 2.6 and 5.4.1 in Quality Assurance Procedure QA-GA-22, a review of nine internal audit reports for 1981 indicated that:

   a. Of the 16 scheduled audit areas, 5 were not audited and another 5 were audited only once.

   b. There were no followup audits in three of six areas in which deficiencies were found.

   c. For six findings, the reply from management in the affected areas exceeded 2 months in one case, and in two cases management had still not replied 8 months after the issue of the deficiency reports.

   d. The Production Manager was not on the distribution for five of nine audit reports.

C. UNRESOLVED ITEMS

None

ORGANIZATION: SANDVIK SPECIAL METALS CORPORATION
KENNEWICK, WASHINGTON

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D. OTHER FINDINGS OR COMMENTS:

1. Material Identification - The segregation and identification of ingots and final anneal lots were verified to follow established procedures. Material was processed on Manufacturing Work Orders which were placed on the tubes, hollows, and trexs. In addition, a color code system is used to further identify material to a job. The three dimensional ultrasonic charts and ultrasonic flaw charts were inspected for two lots of clad. There appeared sufficient charts to demonstrate that all material had been inspected. Material accountability was demonstrated on two lots in final inspection and two lots in process. The entire manufacturing sequence was reviewed in light of material identification. In this area of the inspection, nonconformances B.1.a.(1) and B.1.b were identified.

2. Manufacturing Process Controls - The implementation of Criteria V, X, XIV was inspected. The final inspection of tubing was witnessed; in particular, final dimensional inspection, surface finish measurement, and tube cutting. Laboratory records, procedures and equipment were inspected on tensile testing, hydride orientation, and corrosion testing. The review of testing and inspection records by QA was overchecked for a recent shipment to a customer. The Quality Control Customer Requirements were reviewed for three different customers and the documentation of customer requirements was verified. The prefinal sample inspection was verified as well as the computerized sampling procedure. In this area of the inspection, nonconformances B.2 and B.3 were identified. It was further noted that pretest strain requirement of the customer was not accurately documented to the laboratory.

3. Calibration - This area of the inspection was conducted by observation of six ultrasonic test (UT) standards being used, and review of their applicable calibration records. In addition, calibration records of micrometers, dial indicators, other UT standards, the Tabo furnace (used for final annealing) and its thermocouples, recorders, and potentiometers. As a result of this review, nonconformance B.4 was identified.

4. NDE Controls

   a. Fluorescent Penetrant Examination - This area of the inspection was conducted by observing inprocess fluorescent penetrant examination being performed on thimble tubes being provided to Exxon Nuclear Company, Inc. A review of the penetrant materials being used and their respective material test reports was made. As a result of this review, nonconformance B.5 was identified.

Comment - The ultraviolet light is required to have a light intensity of 90 foot-candles minimum. The NRC inspector measured the light intensity with an uncalibrated Weston light meter which resulted in a reading of approximately 90 foot-candles. However, the ability to accurately identify and assess indications in the material being inspected was severely hampered in that the bottom and sides of the penetrant tank were coated with dried penetrant and developer which produced reflected light to the extent that it interferred with the ultraviolet light. Sandvik Special Metals management personnel agreed to evaluate and take the necessary actions to preclude a recurrence of this condition.

b. Ultrasonic Examination (UT) - This area of the inspection was reviewed by observing inprocess UT being conducted to examine wall thickness, inside and outside diameters, and flaw detection. The tube travel speed and revolutions per minute were compared and verified against the applicable procedure requirements. A review of the setup and test logs at five UT stations was made. There were no unresolved items or nonconformances identified.

5. Training - Applicable procedures and instructions in the QA Manual and QA Procedures Manual addressing training and qualifications of quality assurance personnel were evaluated. The QA files for seven inspectors and six exempt personnel in the QA organization were reviewed to determine what documentation if any, existed to attest to the fact that all employees were indoctrinated and trained in quality assurance. In this area of the inspection, nonconformance B.6 was identified.

Eight individuals from the QA organization were also questioned regarding the awareness of the reporting requirements of 10 CFR Part 21. Only one individual was aware that the requirements were posted in the work area, but he could not remember the specifics of the regulation.

In addition, the QA files for four inspectors did not contain a certification (i.e., NDT Level Qualification) signed and dated by a management official.

6. Document Control - The Master File, Historical File, and the Index Book (maintained by Documentation Specialist) for Process Specifications and Procedures (maintained by Operations Department), Quality Assurance Procedures and Laboratory Procedures (both maintained by the Quality Assurance Department) as well as documents contained at seven work stations, were evaluated to assure that documents, including changes, are reviewed for adequacy, approved for release by authorized personnel, and distributed and used at the location where the prescribed activity is performed.

In this area of the inspection, nonconformances B.1.a.(2), B.1.a.(3), B.1.a.(4), and B.7 were identified.

Although the Documentation Specialist contacts any individual who is not using the signed receipt system for revised documents (ref. paragraph 6.31 of QA-GA-7), additional measures are required in the QA program to assure that the current revision of all documents are being used at the location where a prescribed activity is being performed.

7. Audits - Applicable procedures in the QA Manual and the QA Procedures Manual addressing audits were evaluated. Nine internal audit reports which contained 12 deficiency reports (6 findings and 6 observations) for the year 1981 were reviewed. In this area of the inspection, nonconformances B.8 and B.9 were identified.

   In the area of internal audits, it was noted that audit reports were issued 2 to 3 months after the audit was conducted, and standard checklists did not exist for each of the areas being audited.

   Additional measures are required in the QA program to assure that audits are conducted and reported in a timely fashion; and quality related practices, procedures, instructions, activities, items, and records should be identified on a checklist to ensure that the QA program is effective and properly implemented.

8. Allegations - The inspection findings with respect to the allegations received by the NRC were as follows:

   a. QA/QC is not independent of production - QA/QC was described as very weak and insignificant in the manufacturing process. Review of QA/QC staffing indicated management support of the activity. QA/QC inspection points, hold points, and release points in the manufacturing process were found to be maintained, and no evidence was found to suggest that production pressures unduly influenced QA/QC.

   b. Orders have gone out mixed without the customer's knowledge - All customers require tubes to be segregated by anneal lots. The inspection indicated that the material control system was being implemented, with a review of the identification and color coding system showing tubes to be properly segregated. The allegation also stated that material types, niobium and titanium, may have been mixed. However, titanium is not used in a nuclear application and niobium is only used for a unique nondomestic design.

ORGANIZATION: SANDVIK SPECIAL METALS CORPORATION
KENNEWICK, WASHINGTON

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c. There is not a continuous audit of inspection records - The allegation dealt with inprocess checking of tube ultrasonic testing charts and does not pertain to a specific 10 CFR Part 50, Appendix B requirement. The charts in question were reviewed for several lots at final inspection. Acceptable charts were found for each tube.

d. No Scrap Control - The allegation was that rejected material which had been dispositioned as scrap may be shipped as an acceptable product. Nonconforming material was found to be identified, and that which had been dispositioned as scrap was also found to be segregated as required by procedures.

e. There is no UT of tubes that are reprocessed after removing flat spots - The cold working of clad is limited to a unique nondomestic clad design and is not applicable to domestic products.

f. Laboratory analysis of tubes is not adequate - The allegation implied that anneal lots could be distinguished by laboratory analysis. Available information indicates, however, that reliable discrimination of anneal lots cannot currently be achieved.

It was noted that procedures were not written when they should have been, requirements were not properly documented, and procedures were not fully implemented. Although, the allegation was not specifically supported, nonconformances were identified in this area.

g. QA Manual states every new employee will be given a 1-hour lecture on QA - It was found that there was no documentation of the training of employees. The training procedures and files were reviewed. This allegation was supported by inspection findings and a nonconformance identified.

h. Maintenance of measuring instruments is not being done properly - The allegation was that calibration controls were not properly implemented. A review of calibration controls, tools, and instruments found procedures to be not fully implemented, and a nonconformance was identified. The inspection findings were, therefore, supportive of the basis for the allegation.

ORGANIZATION: SARGENT & LUNDY ENGINEERS
CHICAGO, ILLINOIS

REPORT NO: 99900507/82-01	INSPECTION DATE(S) 5/10-14/82	INSPECTION ON-SITE HOURS: 29

CORRESPONDENCE ADDRESS: Sargent & Lundy Engineers
ATTN: Mr. R. W. Patterson, Senior Partner
55 East Monroe Street
Chicago, Illinois, 60603

ORGANIZATIONAL CONTACT: H. S. Taylor, Head, Quality Assurance Division
TELEPHONE NUMBER: (312) 269-6371

PRINCIPAL PRODUCT: Architect Engineering Services

NUCLEAR INDUSTRY ACTIVITY: Sargent & Lundy (S&L) is the architect engineer on 10 nuclear power plants that are in the design and/or construction phase and has minor involvement at one nuclear power plant that is under construction. S&L is also engaged in modification, repair, or service contracts on 11 operating nuclear power plants.

ASSIGNED INSPECTOR: Dwight E. Chamberlain 6-14-82
D. D. Chamberlain, Reactor Systems Section (RSS) Date

OTHER INSPECTOR(S):

APPROVED BY: C. J. Hale 6/21/82
C. J. Hale, Chief, RSS Date

INSPECTION BASES AND SCOPE:

A. BASES: Sargent & Lundy Topical Report No. SL-TR-1A and 10 CFR Part 50, Appendix B.

B. SCOPE: Design change control.

PLANT SITE APPLICABILITY: This inspection relates to the following plant docket: 50-358.

ORGANIZATION: SARGENT & LUNDY ENGINEERS
CHICAGO, ILLINOIS

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A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

Design Change Control - The S&L topical report and applicable quality assurance procedures and project instructions were examined to determine program commitments in the area of design change control. In order to verify implementation of the program commitments, the following design/design change documents were examined:

1. Forty-five design document changes (both field-initiated and S&L Chicago office-initiated) and 17 related design drawings for the mechanical, electrical, and structural disciplines on the Zimmer project.

2. Nineteen field-initiated design document changes and 16 related design drawings for the electrical discipline on the Clinton project.

Within the scope of this inspection, it appeared that the S&L QA program commitments were being implemented; however, certain items were identified on the Zimmer project that could not be fully inspected in S&L's offices alone, but require further inspection at the Zimmer site. These items are summarized as follows:

1. The Design Document Change (DDC) form has blanks for sign-off by licensee personnel, and on some of the DDC's reviewed, all of the licensee sign-offs were not complete. The S&L project instruction (PI-ZI-2.1) only addresses S&L responsibilities relative to approval of the design changes. It could not be determined that the licensee's QA program was being implemented in this area.

2. S&L approves DDC's affecting vendor design documents. Then the DDC is closed out, but because of S&L's limited responsibilities in the procurement area, there is no assurance that the vendor documents are being revised. It could not be determined what action the licensee is required to take regarding the revision of these vendor documents.

ORGANIZATION: SARGENT & LUNDY ENGINEERS
CHICAGO, ILLINOIS

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3. Some DDC's receive preliminary site approval by S&L, and apparently construction proceeds based on this preliminary approval. A final approval by S&L Chicago office for "essential" DDC's is required and some DDC's examined did not receive final approval for 6 months to 1 year later. More timely, final approval of DDC's is indicated if construction is proceeding based on a preliminary approval.

4. A log of DDC's for the electrical discipline is being maintained by the licensee and it does not appear that the log is being updated on a regular basis. The log reviewed was dated September 1981.

5. The interface between the licensee, S&L site design personnel, and S&L Chicago office design personnel requires further review to determine responsibilities relating to design and design changes.

The above items are being identified for follow-up inspection at the Zimmer project site and the S&L Chicago office.

ORGANIZATION: SYSTEMS CONTROL
DIVISION OF M. J. ELECTRIC, INC.
IRON MOUNTAIN, MICHIGAN

REPORT NO: 99900712/82-01	INSPECTION DATE(S) 6/20-24/82	INSPECTION ON-SITE HOURS: 20

CORRESPONDENCE ADDRESS: Systems Control
Division of M. J. Electric, Inc.
ATTN: Mr. L. A. Capra
Senior Vice President
P. O. Box 788
Iron Mountain, Michigan 49801

ORGANIZATIONAL CONTACT: Mr. J. E. Pezzullo, QA/QC Manager
TELEPHONE NUMBER: (906) 774-0440

PRINCIPAL PRODUCT: Electrical Control Panels

NUCLEAR INDUSTRY ACTIVITY: Twenty-three contracts representing approximately 80% of the total workload.

ASSIGNED INSPECTOR: J. W. Sutton, Reactive & Component Program Section, (R&CPS) — Date: 8-2-82

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes, Chief, R&CPS — Date: 8-3-82

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: Management meeting, 10 CFR Part 21, Nonconformance/Corrective action, Test Control of Completed Products, and Audits.

PLANT SITE APPLICABILITY:

Not identified.

ORGANIZATION: SYSTEMS CONTROL
DIVISION OF M. J. ELECTRIC, INC.
IRON MOUNTAIN, MICHIGAN

REPORT NO: 99900712/82-01	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraphs 16.3.1, 16.3.2, and 16.3.3 in Section XVI of the QA Manual, the Quality Control Department has not been either notifying the Project Engineer by documented means of nonconforming conditions in areas over which he was cognizant, or initiating corrective action requests to eliminate these conditions.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section VI, paragraphs 6.2.1 and 6.2.3 of the SC QA manual, 21 current drawings were observed at a test station which had not been either transmitted by a "Letter of Transmittal," or stamped with the required QC red stamp.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 5.1 in Section V of the QA Manual, documented instructions had not been prepared which address control of drawings using the newly adopted Stick Control System.

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. 10 CFR Part 21 Inspection - The inspector reviewed SC's written policy used for the evaluation and reporting of identified component defects that could be reportable under 10 CFR Part 21 requirements. The inspector reviewed SC's procedure No. 143. Posting of Part 21 requirements was checked and found to be in order. The inspector determined that the requirements for reporting and posting under 10 CFR Part 21 have been complied with as required by regulations.

2. Nonconformance/Corrective Action - The inspector reviewed SC's QA Manual Section XV, "Nonconforming Items" and Section XVI, "Corrective Action." Twenty "Defective Apparatus" forms and associated documentation were reviewed to determine compliance to the QA program requirements. Segregated areas designated for storage of nonconforming items were inspected. As a result of the review of noncompliance/corrective action activities, one nonconformance was identified. (See B.1 above.)

ORGANIZATION: SYSTEMS CONTROL
DIVISION OF M. J. ELECTRIC, INC.
IRON MOUNTAIN, MICHIGAN

REPORT NO: 99900712/82-01	INSPECTION RESULTS:	PAGE 3 of 3

3. Test Control of Completed Products - The inspector reviewed SC's QA Manual Section X, "Inspection" and Section XI, "Test-Control." The inspector observed two contracts in the assembly area being tested by SC QC inspector. Test documentation forms, specifications, check lists, procedures, drawings, and document control system were reviewed for compliance to the QA Manual requirements. The work observed was being completed as per the specification and QA Manual requirements with one exception. As a result of the review of the above documentation, two nonconformances were identified in the drawing control area. (See B.2 and B.3 above.)

4. Audits - The inspector reviewed SC's QA Manual Sections VII and XVIII, "Control of Purchased Materials" and "Audits," for compliance with requirements. The inspector reviewed eight internal and management audits that have been conducted. Also reviewed was the corrective action taken as a result of the above audits. Audits of supplier's procedures were reviewed for compliance. As a result of the review, the inspector determined that the audit requirements for internal and management audits were being followed in accordance with QA program requirements.

ORGANIZATION: TERRY CORPORATION
WINDSOR, CONNECTICUT

REPORT NO.: 99900720/82-01	INSPECTION DATE(S) 6/6-8/82	INSPECTION ON-SITE HOURS: 19

CORRESPONDENCE ADDRESS: Terry Corporation
ATTN: Mr. R. A. Neeld
Vice President and Secretary
Lamberton Road, P. O. Box 555
Windsor, CT 06095

ORGANIZATIONAL CONTACT: Mr. H. Wainscott, Corporate Quality Control Manager
TELEPHONE NUMBER: (203) 688-6211

PRINCIPAL PRODUCT: Steam Turbine & Reduction Gears for Power and Industrial Uses.
NUCLEAR INDUSTRY ACTIVITY: The Terry Corporation's contribution to the nuclear industry represents approximately two percent of its total work load.

ASSIGNED INSPECTOR: Wm. D. Kelley, Reactive & Component Program Section (R&CSP) Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes, Chief, R&CPS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21 and 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made as a result of a 10 CFR Part 21 report by the Tennessee Valley Authority concerning the rotation of the inboard bearing of a Terry Corporation turbine installed in the Browns Ferry Nuclear Plant Unit 3, Reactor Core Isolation Cooling System. Additionally, the following areas were inspected: quality assurance program; and nonconformances and corrective action.

PLANT SITE APPLICABILITY: 50-254; 50-259; 50-260; 50-263; 50-265; 50-271; 50-277; 50-278; 50-293; 50-296; 50-298; 50-322; and 50-333.

ORGANIZATION: TERRY CORPORATION
WINDSOR, CONNECTICUT

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A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Tennessee Valley Authority (TVA): Brown's Ferry Nuclear Plant, Unit 3 - Problem reported was rotation of bearing in reactor core isolation cooling (RCIC) turbine causing partial blockage of the lubricating oil supply.

   a. Background

      TVA issued a 10 CFR Part 21 report to the NRC on February 3, 1982, stating that a routine inspection of the RCIC turbine revealed that the inboard babbit-lined bearing had rotated in its bearing mount causing partial blockage of the lubricating oil supply and could have eventually resulted in rendering the RCIC system inoperable. The cause of the rotation of the bearing was attributed by TVA to the lack of an antirotation pin or device.

   b. Findings

      (1) Contractual Requirements:

         The NRC inspector reviewed the the General Electric Company (GE), Atomic Power Equipment Department, purchase order Number 205-B2104, dated August 16, 1967, with the Terry Steam Turbine Company (TC) and verified that 13 steam turbines were ordered to drive the RCIC system pumps in the following nuclear plants; (a) Tennessee Valley Authority, Brown's Ferry Nuclear Plant, Units 1, 2, and 3; (b) Philadelphia Electric Company, Peach Bottom Atomic Power Station, Units 2 and 3; (c) Commonwealth Edison Company, Quad Cities Station, Units 1 and 2; (d) Northern States Power Company, Monticello Nuclear Generating Station; (e) Boston Edison Company,

ORGANIZATION: TERRY CORPORATION
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Pilgrim Nuclear Power Station, Unit 1; (f) Vermont Yankee Nuclear Power Corporation, Vermont Yankee Nuclear Power Station; (g) Power Authority of the State of New York, James A. Fitzpatrick Nuclear Station; and (h) Nebraska Public Power District, Cooper Nuclear Station.

(2) Notification by TVA and TC Action - In a telephone conversation the last week of January 1982, TVA informed TC that the RCIC system turbine installed in their Brown's Ferry Nuclear Plant, Unit 3, did not have an antirotation pin in the inboard bearing. TC drawing 77574E, as issued to the shop for the assembly of the 13 turbines purchased by GE, did not show the antirotation pin. TC personnel informed the NRC inspector orally that during the 1969-1971 era in which these turbines were assembled, it was TC's standard shop practice to install bearing antirotation pins during assembly. The NRC inspector verified that the antirotation pin hole was detailed on the bearing manufacturing drawing; however, there was no written procedure or subassembly drawing that addressed the layout and drilling of the antirotation pin hole in the bearing cap or the installation of the antirotation pin during assembly. The purpose of the pin was to assure correct location of the bearing during either assembly in the TC shop or during maintenance at the nuclear plant. Rotation of the bearing during operation is prevented, however, by a 0.002 to 0.004 inch pinch fit of the bearing between the bearing cap and the pedestal.

GE purchase order Number 205-B2104 and GE QC Plan 288 required TC to generate and maintain records of all test and inspection operations and the records had to contain the date of inspection, inspector's identification, inspection procedures identification and the results, disposition and date of repairs; also, the original of these quality control records were to be maintained for a period of five years. The NRC inspector was informed that the original copies of the quality control records and shop travelers had not been retained; however, the quality control records and certifed mill test reports had been microfilmed. The NRC inspector reviewed the microfilmed records for the TVA Brown's Ferry Nuclear Plant, Unit 3, turbine and verified that the TC "Quality Control-Turbine Checklist, After Assembly-Before Test," had been signed off by the TC inspector and Item 20 entitled, "All Rotor/Stator Locking Nuts, Shrink Collars, Collars, Set Screws, etc., secured.," had been checked off.

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WINDSOR, CONNECTICUT

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After TVA informed TC that their Brown's Ferry Nuclear Plant, Unit 3, turbine did not have the bearing antirotation pin, TC reviewed the assembly drawings for all turbines sold for installation in nuclear plants and engineering change notices were issued revising 14 assembly drawings and their parts list to include the bearing antirotation pin. In addition, TC reviewed the shop practice for the installation of the bearing antirotation pins and a training session was stated to have been held for the assemblers and inspectors on how the bearing antirotation pins were to be installed and inspected.

The NRC inspector reviewed a select sample of the 14 TC turbine assembly drawings and verified that the engineering change notices had been issued and the assembly drawings and parts lists had been revised to show the bearing antirotation pin; however, the NRC inspector could not verify the training because TC did not document the training session.

TC reviewed the missing antirotation pin in the TVA Brown's Ferry Nuclear Plant, Unit 3, turbine for reportability in accordance with their procedure SOM Number 6.1.111, revision 1, "Reporting of Defects and Noncompliance, 10 CFR Part 21 (Part 21 of Title 10 of the Code of Federal Regulations), for Nuclear Turbine," and issued a report signed by their designated responsible officer on July 8, 1982, that evaluated the failure to install the antirotation pin as not being a reportable safety hazard. It would appear that this determination was made based upon the pin fuction being for location purposes and not to prevent rotation. Consideration of effects of bearing misorientation did not appear to have been included in the evaluation.

(3) Followup Item:

As of this inspection, other TC turbine customers had not been notified of the identified potential for bearing rotation. TC personnel informed the NRC inspector that letters would be sent to the purchasers and/or owners of the TC turbines that have been shipped to nuclear sites, advising them to check their turbine bearing for the installation of the antirotation pin. These letters will be reviewed on a subsequent inspection.

ORGANIZATION: TERRY CORPORATION
WINDSOR, CONNECTICUT

REPORT NO.: 99900720/82-01	INSPECTION RESULTS:	PAGE 5 of 5

2. Quality Assurance Program Review: Reviewed the TC Quality Control Manual, Standard Operating Manual, two design data procedures, two standard practice specifications, two engineering change notices, four design drawings, and documentation microfilm. Verified that procedures referenced in the quality control manual had been implemented to control the quality of the turbines and reduction gears.

3. Nonconformances and Corrective Action: Reviewed TC Quality Control Manual Sections XV and XVI, two standard practice specifications, two welding compliance records and 25 Quality Control Reports. Relative to the documents examined, due to the small amount of nuclear work in the plant Quality Control Reports for both nuclear and commercial turbines were reviewed by the NRC inspector to verify compliance with the standard practice specifications because the standard practice specifications and Quality Control Reports are used to identify nonconformances and document corrective actions for both nuclear and commercial turbines and reduction gears.

ORGANIZATION: WESTERN PIPING AND ENGINEERING COMPANY, INC.
SAN FRANCISCO, CALIFORNIA

REPORT NO. 99900302/82-01	INSPECTION DATE(S): 5/17-21/82	INSPECTION ON-SITE HOURS: 28

CORRESPONDENCE ADDRESS: Western Piping and Engineering Company, Inc.
ATTN: Mr. K. A. Friedman
President
1485 Yosemite Ave.
San Francisco, CA 94124

ORGANIZATION CONTACT: Mr. R. Haytack, Quality Assurance Mgr.
TELEPHONE: (415) 822-6464

PRINICIPAL PRODUCT: Class 1, 2, & 3 nuclear components - vessels and supports.

NUCLEAR INDUSTRY ACTIVITY: Commercial nuclear production of Western Piping and Engineering Company, Inc. (WP&E), San Francisco, California, totals 80% of all production. Seven contracts are presently in-house for current and future production. WP&E ASME Certificate of Authorization expires in 1984.

ASSIGNED INSPECTOR: J. W. Sutton 7-28-82
J. W. Sutton, Reactive & Components Program Section (R&CPS) Date

OTHER INSPECTOR(S):

APPROVED BY: J. T. Conway for 7/20/82
T. Barnes, Chief, R&CPS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and 10 CFR Part 21.

B. SCOPE: This inspection was made to review the status of previous inspection findings, Part 21 inspection, nonconformances - corrective action, machining, calibration, and vendor activities.

PLANT SITE APPLICABILITY: Not identified

ORGANIZATION: WESTERN PIPING AND ENGINEERING COMPANY, INC.
SAN FRANCISCO, CALIFORNIA

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A. VIOLATIONS:

None

B. NONCONFORMANCES:

Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 12 of the QA Manual, measuring instruments were not being entered in the Inspection Usage Log prior to use by the QC inspector for final acceptance inspection.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Deviation (81-01): Vendor was not determining the chlorine content of the medium for the hydrostatic test of stainless steel items.

   The inspector reviewed the corrective action taken by WP&E as outlined in their March 2, 1981, reply to NRC's deviation notice of February 2, 1981. It was further verified that a chloride test kit had been purchased, a chloride test procedure (P-1332-001) has been generated, and a log of the medium testing is being maintained to prevent recurrence. The preventive action taken by WP&E was found to be acceptable.

2. (Open) Nonconformance (81-02): No documented evidence that the threaded fasteners, attaching ears to the load distribution plate of support clamps, had been provided with locking devices to prevent loosening during service.

   The vendor has not submitted his corrective action to the NRC as of the date of this inspection.

E. OTHER FINDINGS OR COMMENTS:

1. 10 CFR Part 21 Inspection - The inspector reviewed WP&E's written policy used for the reporting of identified component defects that could be reportable under 10 CFR Part 21 requirements. The inspector reviewed WP&E reporting procedure P0200-001, Rev. 2, issued February 14, 1981. Posting of Part 21 requirements was checked and found to be in order. The inspector determined that the requirements for reporting and posting under 10 CFR Part 21 has been complied with as required by the regulations.

ORGANIZATION: WESTERN PIPING AND ENGINEERING COMPANY INC.
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REPORT NO.: 99900302/82-01	INSPECTION RESULTS:	PAGE 3 OF 3

2. Nonconformance/Corrective Action - The inspector reviewed WP&E's QA manual section 15.0. "Nonconforming Items or Service," and section 16.0, "Corrective Action". Four NCR's and System Discrepancy Reports (SDR's), and associated documentation were reviewed to determine compliance to QA program requirements. The corrective action taken to prevent recurrence was examined for implementation. Segregated areas designated for storage of nonconforming items were inspected. Relative to the documents examined, the inspector determined that activities were in conformance with the QA program requirements and were being implemented as required.

3. Manufacturing Control (Machining) - The inspector reviewed WP&E's QA manual section 9.0, "Control of Fabrication Processes," and witnessed ongoing machine work within the shop. The inspector reviewed shop orders, procedures, drawings, and related documentation for three jobs in progress. As a result of the review of this documentation, the inspector determined that machining operations were being performed as required by the QA program requirements.

4. Calibration - The inspector reviewed WP&E's QA manual section 12.0, "Control of Measuring and Testing Equipment." Measurement tools being used for final acceptance were checked for calibration dates and compliance to QA procedures. During the course of the inspection, it was observed that the measurement equipment being used for final acceptance of a component, had been calibrated as required, but the equipment had not been entered in the Inspection Usage Log as required by the QA program requirements (see section B of Inspection Results).

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
NUCLEAR FUEL DIVISION
COLUMBIA, SOUTH CAROLINA

REPORT NO.: 99900005/82-01	INSPECTION DATE(S) 7/27-30/82	INSPECTION ON-SITE HOURS: 28

CORRESPONDENCE ADDRESS: Westinghouse Electric Corporation
Nuclear Fuel Division
ATTN: Mr. W. M. Jacobi, General Manager
P. O. Box 355
Pittsburgh, PA 15230

ORGANIZATIONAL CONTACT: Mr. R. R. Cost, Operations Product Assurance
TELEPHONE NUMBER: (412) 373-5105

PRINCIPAL PRODUCT: Nuclear Fuel Assemblies.

NUCLEAR INDUSTRY ACTIVITY: Nuclear fuel supplier for Westinghouse-designed cores.

ASSIGNED INSPECTOR: for W. M. McNeill, Reactive & Component Program Section (R&CPS) — Date

OTHER INSPECTOR(S):

APPROVED BY: for I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: Westinghouse Topical Report WCAP 7800/5A.

B. SCOPE: Control of component fabrication (nozzles); nonconformances and corrective actions; document control; and action on previous inspection findings.

PLANT SITE APPLICABILITY: None identified.

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
NUCLEAR FUEL DIVISION
COLUMBIA, SOUTH CAROLINA

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A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Section 5 of the Topical Report and Quality Control Instruction (QCI)-000147, one of the eight Procedure Checklists sampled, namely a strap inspection procedure, QCI-933025 had not been retained, as required.

2. Contrary to Section 5 of the Topical Report and Manufacturing Operating Procedure-14, a required Operating Procedure-715604, of the 14 procedures sampled, had not been added to the assigned book in work area 61 (Spider Rework Station).

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Nonconformance (81-02): A plating voltage was observed which was above the procedure limits. The procedure in question has been revised and the limits opened. An internal audit in January verified compliance to the revised procedure.

2. (Closed) Nonconformance (81-02): Quality Control Instruction, QCI-93400 and Operating Procedure, OP-711001 did not have the appropriate acceptance criteria and applicable parametric limits as defined by the Process Specification 595221. The QCI, OP and Process Specification all have been revised to establish new acceptance criteria. An internal audit in January verified compliance to the revised procedures and specification. This revision of the Process Specification also made the parametric limits in question target values and not toleranced limits.

3. (Closed) Nonconformance (81-02): There was insufficient documentation available to show that a currently used heat treat procedure had been qualified. Qualification data and reports have been issued for all special processes. Some special processes had been "grandfathered." One qualification memo QC-MJF-81-012, appears to conflict with the product specifications paragraph 5.4 for nozzles, grids, etc. This will be followed up during the next inspection.

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
NUCLEAR FUEL DIVISION
COLUMBIA, SOUTH CAROLINA

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4. (Closed) Nonconformance (81-02): The Maintenance Calibration Card for a tour gage on the Unit B leak detector failed to record the calibration performed on October 22, 1980, and the last entry on the card was misdated. A review of Maintenance Calibration Cards and instruments found no further problem in this area.

E. OTHER FINDINGS OR COMMENTS:

1. Control of Component Fabrication (Nozzles) - The specifications and procedures on nozzle fabrications were reviewed. Nozzle inspection was observed. The inspection records and documentation were reviewed. All activities were found to follow the established procedures.

2. Nonconformances and Corrective Actions - The identification, segregation, disposition, and documentation of nonconformances were verified to follow the established procedures. Eight Deviation Notice Disposition Requests, Quality Control Deviation Notices, Defective Apparatus Tags, and Material Rejection Notices were sampled. It was observed that the status of material could be confused because of the practice of reusing cardboard boxes with DNDR and/or QC Release type tags on them. A number of nozzles were observed with tags of different serial numbers and status on the outside of the storage boxes than that of the hardware and associated routings inside the boxes. Loss of identification did not result because of this, in that routings did identify the materials. Westinghouse is, however, reviewing this practice.

3. Document Control - The review, approval, release, and distribution of procedures were verified to follow the established procedures with the exceptions noted. The controls of changes, revisions, markups, etc., were verified. A sample of eight Quality Control Instructions were reviewed and nonconformance B.1 was identified. It was noted by the NRC inspector, that due to a change in supervision in that area several years ago, the record in question may have been lost or misfiled. Some 11 other such records should have also been issued during that time frame to the area of strap inspection. A sample of 14 procedures, and seven drawings were reviewed. One nonconformance, B.2, was identified on the distribution of OP's. OP-715604 was the only repair type procedure in the sample, although many repair type procedures have been issued. It was reported that the review by the area supervisor did not address repair type procedures due to an oversight.

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
ELECTRO-MECHANICAL DIVISION
CHESWICK, PENNSYLVANIA

REPORT NO: 99900033/82-01	INSPECTION DATE(S) June 7-11, 1982	INSPECTION ON-SITE HOURS: 30

CORRESPONDENCE ADDRESS: Westinghouse Electric Corporation
Electro-Mechanical Division
ATTN: Mr. F. R. Bakos, General Manager
Cheswick Avenue
Cheswick, PA 15204

ORGANIZATION CONTACT: Mr. C. E. Owens, Product Assurance Manager
TELEPHONE NUMBER: (412) 963-5326

PRINCIPAL PRODUCT: Pumps, Control Rod Drives, and Valves

NUCLEAR INDUSTRY ACTIVITY: Approximately 40% of the sales.

ASSIGNED INSPECTOR: W. M. McNeill, Reactive & Components Program Section, (R&CPS) — 7-30-82 Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes, Chief, R&CPS — 7-30-82 Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21 and Westinghouse Topical Report WCAP-8370, Revision 9A.

B. SCOPE: This inspection was made as a result of the issuance of a Preliminary Notification (PNO-II-82-49) to the NRC of failures of reactor coolant pump bolts at the Robinson Unit 2 facility of Carolina Power and Light Company. The diffuser adaptor cap screws were found to have the heads broken off. In addition, followup was performed on the potential failure of valves to close under high differential pressures which has been identified in 10 CFR 50.55(e) reports by various sites. The QA programmatic area of training and status of previous inspection findings were also inspected.

PLANT SITE APPLICABILITY:

H. B. Robinson (50-261)

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
ELECTRO-MECHANICAL DIVISION
CHESWICK, PENNSYLVANIA

REPORT NO: 99900033/82-01	INSPECTION RESULTS:	PAGE 2 of 5

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Section 5.0 of the Topical Report and Product Assurance Instructions PAI 410, ECT 869076 was observed attached to an end closure, Part 5053D73, serial number 1855, one of a lot of three on Shop Order 1S80402 and not to the applicable serial number 1868. It was additionally noted that serial number 1844 of this lot had been reworked for removal of an impression stamping without documentation of this nonconforming condition on an ECT or Material Review Report.

2. Contrary to Section 5.0 of the Topical Report and Interdepartmental Procedure Q-2, the reactor coolant pump's diffuser adaptor cap screw failures at Carolina Power and Light were reported to the WRD Safety Review Committee but were not documented on form AEQA-1460.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Nonconformance (81-02): Internal audit procedures did not require preaudit and postaudit conferences. Procedure PAI 412 has been revised to address all ANSI requirements for conferences. A review of the first quarter's audits found the procedure fully implemented.

2. (Closed) Nonconformance (81-02): Nonconforming parts were not being properly identified, in that a part was found with an incorrect Material Review Report (MRR) referenced. The procedure has been revised. The MRR in question was investigated by Westinghouse and the error corrected. However, a review of nonconforming material found a similar problem dealing with Error Correction Tags (ECT). (See nonconformance B.1)

   It was also noted that an ECT was written on the stamping of the words "Store-handling screws here" (reference drawing no. 5053D73, Rev.14). It was not clear if the stamping was to be on the top side or bottom side of the part. Two parts had the stamping on the top, and one had the stamping on the bottom.

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ELECTRO-MECHANICAL DIVISION
CHESWICK, PENNSYLVANIA

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3. (Closed) Nonconformance (81-02): There was no evidence of QA approval of the deletion of an inspection step. A training seminar was held October 27, 1981, on the implementation of the procedure in question. A review of shop routings found no further problems in this area. The deleted inspection operation was found to have been an unnecessary inspection step.

4. (Closed) Nonconformance (81-02): A plug gage was accepted even though it was outside the specified calibration band. The gage in question was reviewed by Westinghouse, and its undersize condition had no effect on its function. The gage procedure has been reiterated to the Gage Lab personnel. A review of gages on Material Review Reports found no further problems in this area.

E. OTHER FINDINGS OR COMMENTS:

1. Reactor Coolant Pump Bolt Failures - During disassembly of the "B" reactor coolant pump of the Robinson Unit 2 plant for the 10-year inservice inspection, the heads of 4 of the 16 stainless steel diffuser adaptor cap screws (or bolts) broke off. These chrome plated bolts, 4.5 inches in length and 5/8 inch in diameter, hold the diffuser adaptor to the casing adaptor. A review of the original release of the pump cases indicated that the case, diffuser adaptor and bolts were supplied to Westinghouse Electro-Mechanical Division (WEMD) by Essco Company of Portland, Oregon. It was reported that these items were shipped directly to the site for assembly. The internals were fabricated at the Cheswick plant. This pump is an early generation pump, Model 93. R. E. Ginna Nuclear Plant, Turkey Point Plant, Units 3 and 4; Indian Point Station, Units 2 and 3; Point Beach Nuclear Plant, Units 1 and 2; and H. B. Robinson Plant all have Model 93 pumps. The Essco releases indicate that the pump cases were fabricated in late 1966 through 1968. The drawings and specifications call for the bolts to be stainless steel type 302, 304, 305 or 316 and the thread lubricant to be Neolube. The Neolube was specified by WEMD to contain a maximum of 200 ppm chlorine. A letter of compliance was required on the bolts to identify the material used. WEMD could not find this record in its files. Since original purchase order to Essco could not be retrieved during the inspection, it was not clear if the bolts were procured by Essco or supplied to Essco by WEMD.

   Late in 1968, a tolerance stack-up problem was identified which caused a possible interference fit between the pump case and pump internals. A repair/fix program was begun. The repair/fix involved the removal of 13/32 of an inch from the diffuser adaptor. This resulted in a length reduction for the bolts from 4.5 inches to 4.0 inches.

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ELECTRO-MECHANICAL DIVISION
CHESWICK, PENNSYLVANIA

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During this inspection, WEMD could not find documentation of this repair/fix that would show where the remilling of the diffuser adaptor and bolts was done. The bolts also may have been replaced, but no records were found to support this conclusion.

Disassembly of the "B" pump for inservice inspection identified four failed, eight cracked, and four sound diffuser adaptor bolts. Subsequent disassembly and examination of the remaining reactor coolant pumps showed that the "A" pump had 7 failed, 3 cracked, and 6 sound and the "C" pump had 16 sound diffuser adaptor bolts. The trip reports to the Harris Environment Center, Raleigh, North Carolina, were reviewed where the failed bolts from "B" pump were studied. The scanning electron microscope found the cracks to be transgranular multibranching cracks starting at the surface in the thread root. About 400 ppm of chloride was found to be leachable from cracked surfaces. After leaching, the metal sample of the cracked surfaces was found to have between 400 and 2700 ppm chloride. A second test found a total of 800 ppm chlorides on the cracked surfaces. Later testing found 600 and 2600 ppm of chloride. The casing adapter bolts were inspected. These are about 22 inches downstream from the diffuser adaptor bolts. These casing adapter bolts were found to be sound. WEMD has concluded from the results of the failure analysis, that chloride induced stress corrosion cracking was the responsible failure mechanism. The absence of fabrication records, including the repair/fix of the diffuser adaptor and its bolting, precludes positive identification of the source of the chlorides. WEMD believes, however, that the chloride contamination is limited to the H. B. Robinson Unit 2 plant. This is partially supported by the fact that four of eight sites with Model 93 pumps have had 10-year inservice inspection; namely, R. E. Ginna Nuclear Plant, Turkey Point Plant, Unit 3; Indian Point Station, Unit 2; and Point Beach Nuclear Plant. No bolt failures were noted during the same disassembly.

The Water Reactor Division's Safety Review Committee was notified by phone and is reviewing this failure as a potential Part 21 report. WEMD did not fully implement its Part 21 procedure. (see nonconformance B.2)

2. Potential Failures of Valves to Close Under High Differential Pressures - Inspection Report 99900033/81-02 addressed the potential failure of WEMD valves. WEMD had completed its closure testing program, and the results are documented in report EM5683, Revision 1. An Average Valve Factor (VF) has been determined from testing, and design assumptions established for the closings of various size valves. The determined VF should resolve the underpredicting of stem thrust required to close the valve against high differential pressures. The effect of temperature and other variables have been identified.

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
ELECTRO-MECHANICAL DIVISION
CHESWICK, PENNSYLVANIA

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The corrective action planned for each site is a function of the plant requirements as determined by a review of each valve's application and location. These reviews have been performed for most sites, and Field Change Notices have been issued for valves in need of modification. Not all modifications and field inspections of modifications have been completed. Modifications and field inspections at operating plants are completed. Nonoperating plants (some 51 sites) are planned to be completed and inspected by mid-1983. An Engineering Memorandum (EM) will be issued for each site to address the review and modifications. For the nonoperating plants, the EM and site inspection will be followed during a later NRC inspection.

3. Training - The training records of several test and inspection personnel were reviewed. Eye examinations, check lists, and qualification/requalification reports were found to be in order.

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
PENSACOLA PLANT
PENSACOLA, FLORIDA

REPORT NO.: 99900104/82-02	INSPECTION DATE(S) 7/26-29/82	INSPECTION ON-SITE HOURS: 25

CORRESPONDENCE ADDRESS: Westinghouse Electric Corporation
Pensacola Plant
ATTN: Mr. T. D. Miller, Manager, Product Assurance
P. O. Box 1313
Pensacola, FL 32596

ORGANIZATIONAL CONTACT: Mr. T. D. Miller, Manager, Product Assurance
TELEPHONE NUMBER: (904) 477-0535

PRINCIPAL PRODUCT: Nuclear Reactor Vessel Internals, Steam Generators, and Pressurizers

NUCLEAR INDUSTRY ACTIVITY: Approximately 90%

ASSIGNED INSPECTOR: R. E. Oller — 8-19-82
R. E. Oller, Reactive and Component Program Section (R&CPS) — Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes — 8-19-82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50 Appendix B, and 10 CFR Part 21.

B. SCOPE: This inspection was performed to evaluate the implementation of the vendor's QA program in the areas of: material identification and control; weld joint fitup and welding; weld heat treatment; and liquid penetrant examination. In addition, a followup was made in respect to a 10 CFR Part 50.55(e) construction deficiency report by Northeast Utilities/Millstone Unit 3, and a Westinghouse 10 CFR Part 21 report concerning susceptibility for stress corrosion cracking of control rod guide tube support pins.

PLANT SITE APPLICABILITY:

All domestic plants having Westinghouse PWR's.

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
PENSACOLA PLANT
PENSACOLA, FLORIDA

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A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS AND COMMENTS:

1. Material Identification and Control: The NRC inspector reviewed Section 8 of the vendor's QA Manual, which was applicable to identification and control of materials.

   Observations were made of the heat numbers and/or serial numbers (low stress steel stampings) on 10 subassemblies which made up the Four-Loop Upper Internal and Core Barrel Fitup Assembly of reactor pressure vessel internals for Job Order No. 424 (Vogtle No. 2), to verify that traceable identification is maintained during fabrication and the markings are legible and not detrimental to the item.

   To verify that material is identified, controlled, and the results documented in accordance with requirements, a review was made of: manufacturing route sheets for three major reactor vessel internal assemblies; an engineering release for six manufacturing instructions; two manufacturing instructions; an inspection instruction, numerous assembly status sheets; and a fabrication drawing.

   Within this area of the inspection, no nonconformances or unresolved items, in respect to NRC, ASME Code, and QA Program requirements, were identified.

2. Weld Joint Fitup and Welding: The NRC inspector reviewed Section 9 of the vendor's QA Manual, which was applicable to the control of fitup and welding.

Observations were made of in-process Code welding on two different steam generator subassemblies to verify that the essential variables and other parameters of the applicable welding procedure specification (WPS) were being followed at the work stations; also, that the welding equipment was in good condition and calibrated where required.

To verify that the welding is conducted in accordance with a process control traveler; the welding is performed by qualified personnel; weld geometry and fitup meet Code requirements; repairs by welding are performed in accordance with Code requirements by qualified personnel; and the welding is suitably documented, a review was made of: an in-process route sheet controlling the welding of a trunnion to a steam generator barrel; the specified WPS; the related QC weld log record; a weld repair route sheet controlling a stainless steel cladding repair in a nozzle of a steam generator channel head; the related weld status sheet record; and qualification records for the three welders who performed the observed welding.

Within the area of the inspection, no nonconformances or unresolved items, in respect to the NRC, ASME Code, and QA program requirements, were identified.

3. Weld Heat Treatment: The inspector reviewed paragraph 9.5 of Section 9 of the vendor's QA Manual, which was applicable to the control of post-weld heat treatment (PWHT) of welds.

Observations were made of the stress-relieved girth welds and thermocouple attachment areas, on a steam generator lower shell assembly, which had just been removed from a vertical electric furnace. Also, the calibration status of the six temperature controllers on the furnace control console was observed.

To verify that the PWHT of the welds in the steam generator assembly was controlled by a process control traveler; the PWHT was performed in accordance with an approved procedure; and the results were documented and evaluated; a review was made of: three pages of the applicable route sheet for the observed assembly on Shop Order No.4032; the specified PWHT Procedure No. DMP-15-4-5524, Revision 9; Inspection Procedure No. QIP-3146, Revision 2; and the QIP-3146 heat treatment summary record sheet.

Within this area of the inspection, no nonconformances or unresolved items, in respect to the NRC, ASME Code, and QA program requirements, were identified.

4. Liquid Penetrant Examination: The NRC inspector reviewed paragraph 9.4 of Section 9 of the vendor's QA Manual, which was applicable to the control of nondestructive examination.

   Observations were made of liquid penetrant examination (PT) of a machined hardfacing surface on a vessel clevice, and of an electron beam buttweld in an instrumentation column assembly. Also, the containers of two dye penetrants, the developer, and the cleaner in use were observed for Westinghouse identification heat numbers, to verify traceability.

   To verify that the performance of PT is controlled by a process traveler, performed in accordance with an approved and qualified procedure by qualified personnel, and the results are properly documented and evaluated, a review was made of: the controlling original route sheet and a repair route sheet for the PT of the hardfacing of the above vessel clevice; the related quality inspection procedure; the sensitivity report for the PT materials; the demonstration record for the PT Procedure QIP-8102; the P. O., receiving inspection report, quality release and the supplier's certifications for all of the observed PT materials; the route sheet controlling the PT of the above buttweld, and records of certification for the two Level 2 NDE technicians who performed the above PT.

   Within this area of the inspection, no nonconformances or unresolved items, with regard to the NRC , ASME Code, and QA program requirements, were identified.

5. Control Rod Guide Tube Support Pins:

   a. Introduction: This item is a followup at the Westinghouse Pensacola, Florida, reactor vessel internals manufacturing plant, of a 10 CFR Part 50.55(e) report by Northeast Utilities/Millstone Unit 3, and a 10 CFR Part 21 report by Westinghouse Electric Corporation to the NRC, concerning the identification of potential failures of control rod guide tube support pins due to stress corrosion cracking. This matter was previously followed up on at the Westinghouse Nuclear Technology Division in Monroeville, Pennsylvania (see Inspection Report No. 99900404/81-02).

      The event which prompted Westinghouse to report this matter was an inspection at a foreign plant where stress corrosion cracking of these pins was detected. Northeast Utilities reported this matter to the NRC, based on information which Westinghouse supplied to them.

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
PENSACOLA PLANT
PENSACOLA, FLORIDA

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Prior to 1982, pin failures had occurred only in foreign plants. Since then, pin failures have occurred in the North Anna Unit 1 Plant in May 1982, and in a French plant.

b. Findings: Review during this inspection, verified that Millstone 3 was initially reported by Westinghouse as containing support pins which had been solution heat-treated at less than 1800° F, and were, therefore, considered susceptible to stress corrosion cracking. However, during a later review of manufacturing information by Westinghouse, it was determined that Millstone 3 pins had received an 1800° F solution heat treatment and were no longer considered suspect.

In regard to the overall pin problem, the support pins furnished by Westinghouse for domestic plants are made from Inconel X-750 material, and purchased from various suppliers in a final machined, solution annealed and age-hardened heat-treated condition. Review of an early Westinghouse purchase specification (1967) for support pins showed requirements for only chemical composition, a 1325° F age-hardening heat treatment, and a minimum hardness value as evidence of mechanical properties. In later purchase specifications, an 1800° F solution treatment and 1350° F age-hardening heat treatment were specified by ordering the pin material to Grade 688, Type 2 of the ASME SA-637 specification. The most recent Westinghouse purchase specification No. A637C01, Revision A, dated September 30, 1981, specifically identifies a required 2000° F solution heat treatment and a 1300° F age-hardening heat treatment. This 2000° F treatment is based on research performed by Westinghouse and is considered the temperature which will provide the optimum resistance to stress corrosion cracking in the support pin material. All replacement pins, including those for North Anna 1, will have the 2000° F heat treatment.

Other corrective/preventive actions by Westinghouse were to redesign the pin dimensions and to lower the pin installation torque requirements.

Review also verified that Westinghouse has accounted for all domestic operating and nonoperating plants with pins having low solution heat treatment (1625° F) and all domestic plants which

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
PENSACOLA PLANT
PENSACOLA, FLORIDA

REPORT NO.: 99900104/82-02	INSPECTION RESULTS:	PAGE 6 of 6

have had the pins replaced with the improved solution heat-treated pin material. All foreign plants in both categories have also been accounted for.

Westinghouse has contacted all affected operating plants. They have issued two written notifications dated July 1 and July 22, 1982, to their affected clients, in which their report to the NRC has been noted concerning the suspect pins. Also, a recommendation for monitoring and inspection of the pins was made.

In addition, after a recent French plant pin failure, Westinghouse conducted an information exchange on June 2, 1982, with the NRC Office of Inspection and Enforcement in Bethesda, Maryland, with regard to the status of the pin problem.

This inspection verified that the 10 CFR Part 21 reporting requirements were met by Westinghouse concerning informing the NRC and affected clients.

Within this area of the inspection, no nonconformances, unresolved items, or violations were identified.

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
MEDIUM MOTOR AND GEARING DIVISION
BUFFALO, NEW YORK

REPORT NO.: 99900294/82-01	INSPECTION DATE(s) 6/21-25/82	INSPECTION ON-SITE HOURS: 40

CORRESPONDENCE ADDRESS: Westinghouse Electric Corporation
Medium Motor and Gearing Division
ATTN: D. L. Hoover, General Manager
P. O. Box 225
Buffalo, New York 14240

ORGANIZATIONAL CONTACT: Mr. R. F. McKeever, QA Manager
TELEPHONE: (716) 631-2128

PRINCIPAL PRODUCT: Electrical Motors

NUCLEAR INDUSTRY ACTIVITY: Approximately 5% of the work load are motors for nuclear application.

ASSIGNED INSPECTOR: I Barnes
W. M. McNeill, Reactive and Components Program Section (R&CPS) — Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: Control of special processes, and status of previous inspection findings.

PLANT SITE APPLICABILITY: Not identified.

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
MEDIUM MOTOR AND GEARING DIVISION
BUFFALO, NEW YORK

REPORT NO.: 99900294/82-01	INSPECTION RESULTS:	PAGE 2 of 5

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and the QA Manual, Section 2.0, one of the four General Orders reviewed, namely NA 40236, was found with missing pages from two customer specifications; i.e., only the first two pages of the documents (Motor Specifications Sheets, Numbers 1 and 2) were on file, although the documents were, respectively, four and five pages in length.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Quality Control Instruction (QCI), Number 19, a review of current Error Correction Tags issued by assembly area B-8 showed that the hardback copies were not being stamped after completion of satisfactory repair and reinspection.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and the QA Manual, Section 5.0, the Quality Control Instruction (Book Number 3) on file at receiving inspection did not contain QCI Number 7 and the latest revision (i.e., No. 2) of QCI Number 1.

4. Contrary to the previous corrective action letters none of the stock purchase orders reviewed during the inspection identified the revision of the referenced Purchase Department Specification.

5. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and the QA Manual, Section 6.0, the temperature controller for oven number 6 in the "dip and bake" area was found to be in use and overdue for calibration. The calibration sticker indicated it was overdue as of May 31, 1982.

6. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and the QA Manual, Section 16.0, the requirements in the area of process/control were not fully implemented. For example:

   a. The specifications for brazing and "dip and bake" did not define the applicable essential variables for brazing and "dip and bake."

   b. A Shop Practice Sheet was not issued for brazing, although the specification contained very specific information on torch flame requirements for brazing. Furthermore, the Shop Practice Sheet for "dip and bake" did not contain the applicable tolerances identified in the process specification with respect to prebake time, temperature for removal from oven, baking temperature, and position of cores during "dip and bake."

c. The Shop Practice Sheets were not fully implemented in that the masking identified in Shop Practice Sheet Number 21 for the B-66 area was not performed.

d. Inspection criteria were not fully implemented in that the sediment checks and homogeneity checks were not performed as required by the specification for "dip and bake". It was also noted that applicable process specifications were neither on file at operator's work locations, nor identified by work instructions.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Nonconformance (81-01): Detailed procedures on the transfer of contractural requirements had not been established.

   The missing contract documents of General Order BU01882 have been added to the files at the manufacturing plant. Orders for nuclear safety-related motors are entered on the Apparatus Marketing System (AMS). Four General Orders were reviewed at the manufacturing plant and two were compared to General Orders on file in the Buffalo sales office. All the customer's technical and quality requirements were found to be on file at the manufacturing plant with the exception noted below. One General Order was found which referenced two specifications. However, not all pages of the specifications were on file at the manufacturing plant. This is identified as nonconformance B.1 above.

2. (Closed) Nonconformances (81-01): Final inspection and release were performed on six motors without evidence that all contractual requirements had been complied with by Westinghouse.

   A certification concerning "mercury-free" fabrication conditions has been issued for the motors on Shop Order 78C36121. The procedure has been reviewed with the personnel issuing releases. The release and certification of two recent shop orders found certifications which complied with the customer requirements.

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
MEDIUM MOTOR AND GEARING DIVISION
BUFFALO, NEW YORK

REPORT NO.: 99900294/82-01	INSPECTION RESULTS:	PAGE 4 of 5

3. (Closed) Nonconformances (81-01): Manufacturing Information (MI) sheets were issued to the shop without all applicable specifications.

   The missing specification 892179 has been added to the shop order folder. The procedure was reviewed with the Order Processing Supervisor. An inspection of a sample of released Shop Orders found the MI sheets to be complete with all specifications.

4. (Closed) Nonconformance (81-01): DA Tags were not stamped and their stub removed after repairs.

   Two of the tags in question were verified to have been repaired acceptably. Two tags have been lost of the four in question. The procedure has been revised. A review of several DA Tags on motors in the assembly area found the repair status properly identified. Stubs were found to be removed after the repair and the tags stamped.

5. (Closed) Nonconformance (81-01): The green paper copies of Error Correction Tags (ECT) were not removed from the to-be-repaired hardware and the hardback copies were removed from repaired hardware.

   The tags in question were corrected, green copies removed after issuance and hardback copies removed after repair. The inspection personnel have been reinstructed to follow the current procedure. A review of ECT's in the assembly and test areas found the procedure to be implemented with the exception noted below. The green paper copies were removed before repair and the hardback copies removed after repair. However, it was noted that inspection was not stamping the hardback copies denoting the acceptance of a repari. This problem seemed to be limited to the assembly inspection area (B-8). This is identified above as nonconformance B.2.

6. (Closed) Nonconformance (81-01): Corrective and preventive actions were not implemented on three of four deviations identified in inspection report 78-01.

   a. Preventive action on the revision of QC Instruction 14 had not been implemented. This preventive action was to increase the gage audit frequency. The instruction has been revised and the gage audit program implemented. An inspection of gages in the shaft fabrication and rotor assembly areas found these areas to have been audited regularly by the gage inspector. A spot check of the gages found no evidence of gages out of calibration, unassigned, or uncontrolled in these areas.

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
MEDIUM MOTOR AND GEARING DIVISION
BUFFALO, NEW YORK

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b. Preventive actions in receiving inspection on the issuance of a bulk sampling procedure, on drawing control and on issuance of Defective Material Reports were not implemented. A survey of the receiving inspection area found the procedures in question implemented. Review of the receiving inspection records found that a bulk sampling procedure was implemented. However, it was noted that the Quality Control Instructions (QCI) on file were not controlled in that one QCI (number 7) was not on file and one QCI (number 1) was not the current revision level. The missing QCI was placed on file during the inspection. However, this nonconformance is identified above as B.3. In regard to drawing control, a sample of drawings in use currently found no out-of-date documents. A review of recent lab reports established that all nonconforming material was being properly identified with Defective Material Reports.

c. Preventive action on the issuance of procedures to assure applicable revisions of specifications are referenced in purchase orders. An automatic updating of the inventory system's computer controlled stock orders is not in effect presently. A review of stock orders found Purchase Department Specifications (PDS) were not referenced by revision level on the stock orders. This is identified as nonconformance B.4 above.

E. OTHER FINDINGS OR COMMENTS:

The processes of brazing and "dip and bake" were inspected. Motor coils and cores had coil wires brazed to leads. "Dip and bake" is the NEMA Class B varnish insulation of motor windings. The procedures and specifications of the processes were reviewed. The processes were observed in progress on the shop floor. The use of proper materials, process limits, and calibrated equipment was verified with the exceptions noted. Two nonconformances to the QA Manual were identified in this area. Nonconformance B.6 is very broad in its scope and identifies problems in process control at several levels and departments; for example, design engineering, manufacturing engineering, manufacturing supervision and inspection. In regard to brazing, the oxygen and acetylene pressures observed in use were 10 psi and 4 psi above the maximum limits of the specification. Also the brazing material used was rods, while the specification called for wire. Regarding "dip and bake," the baking temperatures were observed to be 20° F above the maximum permissible specification temperature. It was also noted that the wax identified in the process specification was not referenced in the Shop Practice Sheet. These problems are related to not having Shop Practice Sheets and all the specification information identified in them.

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
SWITCHGEAR DIVISION
EAST PITTSBURGH, PENNSYLVANIA

REPORT NO.: 99900330/82-01	INSPECTION DATE(S) 5/3-6/82	INSPECTION ON-SITE HOURS: 24

CORRESPONDENCE ADDRESS: Westinghouse Electric Corporation
Switchgear Division
ATTN: Mr. D. M. Sauter, General Manager
700 Braddock Avenue
East Pittsburgh, PA 15112

ORGANIZATIONAL CONTACT: Mr. H. I. Stahr, QA Manager
TELEPHONE NUMBER: (412) 829-4497

PRINCIPAL PRODUCT: Switchgear Assemblies

NUCLEAR INDUSTRY ACTIVITY: Less than one percent of Westinghouse switchgear assemblies are nuclear. Presently, there are four open orders for about 200 assemblies, most of which are Class 1E.

ASSIGNED INSPECTOR: J. T. Conway /for — 6/21/82
W. M. McNeill, Reactive & Component Program Section (R&CPS) — Date

OTHER INSPECTOR(S):

APPROVED BY: J. T. Conway /for — 6/21/82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: Test controls, control of special processes, and status of previcus inspection findings.

PLANT SITE APPLICABILITY:

Not Identified.

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
SWITCHGEAR DIVISION
EAST PITTSBURGH, PENNSYLVANIA

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A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Deviation (79-01): The QA program did not address the requirements for QA records. QAP number 4 has been issued which addresses the requirements for QA records.

2. (Closed) Nonconformance (81-01): Records were not maintianed as required by applicable specific contract requirements such as OPS-386-2. A contract change notice has been issued to waive the requirements of OPS-386-2 which were not maintained.

3. (Closed) Nonconformance (81-01): Drawings were not controlled in that two out-of-date revisions were found and a master drawing list was found to contain two entries with erroneous revision levels. A review of a current job in-process found no further problems in this area. Drafting has issued a memo which addresses prevention of this problem.

4. (Closed) Nonconformance (81-01): Sampling inspection was not defined in procedures. Quality Control Instruction number 135 has been revised to document the use of MIL-STD-105.

5. (Closed) Nonconformance (81-01): The sequence of calibration operations precluded the identification of some "out-of-calibration tools." The calibration procedure QCI-20 has been revised and issued to address the problem identified.

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
SWITCHGEAR DIVISION
EAST PITTSBURGH, PENNSYLVANIA

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E. OTHER FINDINGS OR COMMENTS:

1. Test Controls - The functional testing of three recent orders was reviewed for jobs 02YN163, 01YN093, and 01YN094. The test logs were inspected and the test procedures reviewed. The customer requirements and procedures were found to be implemented with the exception noted in the followup item (below). Insulation, polarity, sequence, etc., were the type tests being performed. The use of approved drawings and procedures was verified. The documentation and disposition of defects found during testing were verified to follow established procedures.

2. Followup Item - It was noted that the seismic testing of assemblies for jobs 01YN093 and 01YN094 did not have steps 5.2 to 5.4 of its special testing instructions completed, although the units were released. The customer approval of the special testing instructions and the standard testing appears to have been waived; however, the documentation of this is confusing. Engineering is to pick up the missed test steps prior to seismic testing, and the test data is to be reviewed and approved by the customer. The above will be verified during the next inspection with a general review of test control measures.

3. Control of Special Processes - The standard processes of plating, welding of cabinets, and coil impregnation were inspected. These processes are used for both nuclear and nonnuclear applications. Parts of these points in fabrication are generally not designated for their final application. Conformance to procedures and specifications was verified. Analysis of plating tanks was verified. Qualification of welding personnel was verified. The viscosity checks of the varnish used for impregnation were verified. The inspection procedure on coil impregnation QCI-100, should be revised to document current practices.

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ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
NUCLEAR TECHNOLOGY DIVISION
MONROEVILLE, PENNSYLVANIA

REPORT NO: 99900404/82-01	INSPECTION DATE(S) 6/21-25/82	INSPECTION ON-SITE HOURS: 54

CORRESPONDENCE ADDRESS: Westinghouse Electric Corporation
Nuclear Technology Division
ATTN: R. J. Slember, General Manager
P. O. Box 355
Pittsburgh, Pennsylvania 51230

ORGANIZATION CONTACT: P. T. McManus, Manager, Product Assurance
TELEPHONE NUMBER: (412) 273-7988

PRINCIPAL PRODUCT: Nuclear Steam Supply Systems

NUCLEAR INDUSTRY ACTIVITY: The Nuclear Technology Division of Westinghouse Electric Corporation (W) employs approximately 2,212 people, 100% of which are assigned to domestic nuclear power plant activities.

ASSIGNED INSPECTOR: R. H. Brickley 8/10/82
R. H. Brickley, Reactor Systems Section (RSS) Date

OTHER INSPECTOR(S): P. H. Harrell, RSS

APPROVED BY: C. J. Hale 8/10/82
C. J. Hale, Chief, RSS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and Topical Report No. WCAP-8370.

B. SCOPE: Inspection made in response to the following: (1) a Preliminary Notice from Pacific Gas & Electric Company (Diablo Canyon) concerning an apparent failure by W to forward to licensees revisions of a Pacific Pump Company instruction manual; (2) a request from NRC:RII concerning an apparent failure by W to perform audits of suppliers at least every 3 years; (3) a (cont. on next page.)

PLANT SITE APPLICABILITY:

Docket Nos. 50-275, 50-323, 50-390, and 50-391.

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
NUCLEAR TECHNOLOGY DIVISION
MONROEVILLE, PENNSYLVANIA

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B. SCOPE: Cont.
construction deficiency report from NRC:RII concerning incorrect values in computer code UHISATAN provided by W to TVA for use in calculating peak clad temperatures following a potential accident at Watts Bar; and (4) a notification to the NRC Office of Inspection and Enforcement that under certain conditions stipulated by Babcock & Wilcox, W designs may provide inadequate core cooling. In addition, supplier performance and verification of supplier activities were inspected.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

Contrary to commitments contained in Table 17-1 of WCAP-8370, Revision 9A, W had not performed a formal evaluation each year or conducted an audit of Anchor Darling every 3 years to maintain them as a qualified supplier nor had they otherwise requalified them prior to Anchor Darling performing modifications to valves for Watts Bar. The last audit of Anchor Darling was in March 1975, and the last Supplier Performance Evaluation in November 1977.

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Control of Supplier Manual Revisions - An NRC Preliminary Notification dated October 18, 1981, (PNO-V-81-60) reported a failure of a safety injection pump at Diablo Canyon during surveillance testing. Inspection revealed the pump wear ring had seized the shaft. Reportedly, the pump manufacturer (Pacific Pump) had issued a change to their instruction manual for this pump about January 1981, which corrected this problem. This change was transmitted to Pacific Pump customers, W in this case, but W apparently did not forward the change to the licensee.

   A review of the records maintained by W on this item disclosed: (1) Procurement Advisory Release (PAR) No. 38, issued by W to Pacific Pump on November 2, 1981, gave an approval status code of I indicating the subject change had been received for information; (2) the change to the Operations & Maintenence Instruction (Sections 6E-6 and 6E-9) recommended replacement of the impeller nut set screws with Locktite 242 the next time the pumps are disassembled for service or

repair; and (3) the subject change had been transmitted in November 1981, to all affected licensees; i.e., D. C. Cook 1 and 2, Zion 1 and 2, Diablo Canyon 1 and 2, Salem 1 and 2, Sequoyah 1 and 2, and Trojan 1.

There were no nonconformances or unresolved items identified.

2. Failure to Perform Triennial Audits of a Supplier - This item was identified by the NRC Region II Resident Inspector at Watts Bar. TVA had contracted Anchor Darling, through Westinghouse, to modify upper head injection isolation valves. During a Region II inspection of TVA's QA procurement services, the available records indicated that W had not conducted triennial audits of Anchor Darling per their commitment in their topical report WCAP-8370, Revision 9A, Table 17-1.

   The inspectors reviewed the Water Reactor Division (WRD) Policy & Procedures (PAP) Manual and Product Assurance Procedures Manual, qualified supplier list, supplier performance evaluations, and supplier audits. Those records maintained on the following suppliers were reviewed: Anchor Darling, Speedway, Southwest Fabricators, Pacific Pump, Ingersoll-Rand, Joseph Oat, and ITT-Barton.

   The review of Anchor Darling records disclosed that the last audit was conducted on February 11-12, 1975, and the last supplier performance evaluation on November 16, 1977. The supplier performance evaluation stated that all equipment had been shipped, no new orders placed or anticipated, and that an audit was required prior to placement of new orders or activities on equipment returned from sites. Anchor Darling was not listed on the latest W qualified supplier list. The nonconformance, identified in B above, is a result of this review. Annual supplier performance evaluations and triennial audits of the remaining six suppliers had been performed as committed for the time period examined.

3. Core Cooling Concerns - The NRC's Office of Inspection and Enforcement was notified by Babcock & Wilcox (B&W) on January 12, 1982, that provisions included in guidelines provided to B&W's operating reactor owners on inadequate core cooling that, if followed, could result in inadequate core cooling. If, during a small LOCA, the Engineered Safety Features Actuation System is automatically actuated due to low reactor coolant system pressure, and inadequate core cooling conditions (superheat) are incorrectly indicated due to instrument errors, then the operator, by following the guidelines, would allow the reactor coolant pumps to continue to run. But in actuality, due

to instrument errors, the reactor coolant system could be at saturated conditions, rather than superheated. Subsequent loss of the pumps could occur prior to the high pressure injection system filling the RCS.

Thus, if the operator were misled by instrument errors and if the pumps were subsequently lost, unacceptable core cooling conditions could be created. B&W had notified their licensees of the measures needed to correct this situation.

The objective of this inspection was to determine if W was aware of the B&W concern and, if so, had they reviewed their guidelines with respect to this concern. The inspector reviewed the results of a W study which concluded that the concerns expressed by B&W are not applicable to the guidelines prepared by W for their customers. This conclusion was based on recommended operator actions which are prompted by a set of parameters which include, but are not limited to, coolant thermodynamic state. For all criteria, instrument uncertainties were included in the development of action level values.

4. Error in the Computer Code UHISATAN - This item was reported to NRC Region II via a CDR from the licensee (TVA) and concerns erroneous output data from the W computer code UHISATAN. This code is used to produce data for calculating peak clad temperatures during a large break LOCA.

   The inspector reviewed applicable procedures and the records maintained by the Safety Review Committee on this item (PI-81-145). This review disclosed that:

   a. This problem was created by a hardware malfunction that was detected during routine preventive maintenance of the A-system computer on or about March 21, 1979.

   b. System users were notified of this malfunction on March 21, 1979, and were advised to check the accuracy of their results.

   c. Reportedly, the responsible engineer reviewed the results of the Watts Bar run, compared the data with those of similar runs, and concluded that the results were correct.

   d. A subsequent change in code input data initiated a rerun. This time the code was run on the B-system computer and gave significantly different results. Further investigation disclosed that the A-system (MFA) and B-system (MFB) versions of the most recent cycle of the configurations code did not produce identical results.

When the absolute version of the code on MFA was produced (3/15/79), unreproducable computer hardware caused the computer (FTN4.1) to produce errors in the absolute file version of the code during conversion from Fortran to machine language.

e. The rerun of the code for Watts Bar resulted in an increase in the highest peak clad temperature from 2095° to 2171° F.

f. The W investigation of this problem involves some 250 analyses that were run on MFA from January 1978 to the present. At the time of this inspection, 200 of these had been checked with the only identified errors being those in UHISATAN. All ECCS codes that were run during the period in question have been checked.

A review of the status of the W investigation of the effect of the computer malfunction on safety-related codes will be conducted during a future inspection.

There were no nonconformances or unresolved items identified.

5. Supplier Performance - Applicable procedures from the PAP Manual were reviewed to determine that procedures had been prepared and approved by W that prescribe a system for evaluation of supplier performance which is consistent with the commitments in Topical Report No. WCAP-8370. The records maintained on six items procured for Comanche Peak from six suppliers (Speedway, Southwest Fabricators, Pacific Pump, Ingersoll-Rand, Joseph Oat, and ITT-Barton) were reviewed to determine that the evaluation of supplier performance procedures had been properly and effectively implemented.

There were no nonconformances or unresolved items identified.

6. Verification Activities - Applicable procedures from the PAP Manual were reviewed to determine that procedures had been prepared and approved by W that prescribe a system for verification activities which is consistent with commitments in Topical Report No. WCAP-8370. The records maintained on six items procured for Comanche Peak from the six suppliers identified in paragraph 5 were reviewed to determine that the procedures for verification activities had been properly and effectively implemented. Qualification of surveillance personnel will be reviewed during a future inspection.

There were no nonconformances or unresolved items identified.

ORGANIZATION: YORK ELECTRO-PANEL CONTROL COMPANY, INC.
YORK, PENNSYLVANIA

REPORT NO.: 99900713/82-01	INSPECTION DATE(S) 5/18-20/82	INSPECTION ON-SITE HOURS: 24

CORRESPONDENCE ADDRESS: York Electro-Panel Control Company, Inc.
ATTN: Mr. Don Eckert, President
York County Industrial Park
P. O. Box 1702
York, PA 17405

ORGANIZATIONAL CONTACT: Mr. J. M. Myers, QA Manager
TELEPHONE NUMBER: (717) 764-9864

PRINCIPAL PRODUCT: Instrument control panels, boards, and racks.

NUCLEAR INDUSTRY ACTIVITY: Approximately 20%.

ASSIGNED INSPECTOR: J Barnes for R. E. Oller, Reactive & Components Program Section (R&CPS) — Date: 7-14-82

OTHER INSPECTOR(S):

APPROVED BY: J Barnes I. Barnes, Chief, R&CPS — Date: 7-14-82

INSPECTION BASES AND SCOPE:

A. Bases: 10 CFR Part 50, Appendix B and 10 CFR Part 21.

B. Scope: Manufacturing process control, internal audits, nonconformances and corrective action, and reporting of defects.

PLANT SITE APPLICABLILITY: Bellefonte Unit 1 (50-439), Seabrook Unit 1 (50-443).

ORGANIZATION: YORK ELECTRO-PANEL CONTROL COMPANY, INC.
YORK, PENNSYLVANIA

REPORT NO.: 99900713/82-01	INSPECTION RESULTS:	Page 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Manufacturing Process Control - The inspector reviewed four sections of the vendor's QA Manual, Revision 0, which were applicable to fabrication, assembly, inspections, and tests of instrumentation panels and racks. Observations were made of panel and rack welding fabrication in Plant No. 2, and instrumentation mounted racks in Plant No. 1.

   To verify that panels and racks were fabricated, and the instruments were mounted, inspected and tested, and the results documented, in accordance with requirements, a review was made of: 5 standard operating procedures governing inspections and tests; in-process records for a reactor level transmitter rack; welding control documents consisting of personnel qualifications and certifications, welding wire records, and a welding procedure and its qualification records; 2 customer purchase specifications; release records for 20 instrument racks for TVA-Bellefonte Unit 1; 10 record packages for completed and shipped instrument control racks, and 9 record packages for the nine sections of the main control board shipped to United Engineers and Constructors, Seabrook Unit 1.

   Within this area, no nonconformances or unresolved items with respect to NRC, or QA program requirements were identified.

2. Internal Audits - The inspector reviewed Section 15, "Audits," of the vendor's QA Manual.

   To verify that planned periodic audits of all aspects of the QA program are performed, and followup action is taken where indicated

a review was made of: two internal audit schedules for the period of October 1980 through September 1982; 19 internal audit reports (checklists) for audits performed during the same period; and qualification requirements for auditors and the certification records for two auditors.

Within this area, no nonconformances or unresolved items with respect to NRC or QA program requirements were identified.

3. Nonconformance and Corrective Action - The inspector reviewed Section 11, "Deficiencies During In-Process Manufacturing," of the vendor's QA Manual.

To verify that nonconforming items are reviewed and accepted, rejected, repaired, or reworked; and that conditions adverse to quality, including the cause, are promptly identified and corrected; a review was made of: 3 deficiency reports and the related red hold tags for in-process manufacturing nonconformances; 10 receiving inspection disposition reports and the related yellow hold tags for nonconforming purchased items; and 6 inspection test punch lists identifying nonconformances and their subsequent dispositions found during in-process inspections and tests.

Within this area, no nonconformances or unresolved items with respect to the NRC or QA program requirements were identified.

4. Reporting of Defects - The inspector reviewed the vendor's standard operating procedure No. 128, revision 0, "Compliance with 10 CFR part 21," to verify that documented measures are available to meet the reporting requirements of 10 CFR Part 21. Observation was made of the above procedure and other required documents posted on the bulletin board, as required by 10 CFR Part 21.

Within this area, no violations were identified.

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NRC FORM 335 (7.77)

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This periodical covers the results of inspections performed by the NRC's Vendor Program Branch that have been distributed to the inspected organizations during the period from July 1982 through September 1982. Also included in this issue are the results of certain inspections performed prior to July 1982 that were not included in previous issues of NUREG-0040.

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QUARTERLY REPORT
OCTOBER 1982 - DECEMBER 1982

UNITED STATES NUCLEAR REGULATORY COMMISSION

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LICENSEE CONTRACTOR AND VENDOR INSPECTION STATUS REPORT

QUARTERLY REPORT
OCTOBER 1982 - DECEMBER 1982

Manuscript Completed: December 1982
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Prepared by: Region IV
U.S. Nuclear Regulatory Commission
Arlington, TX 76011

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PREFACE

A fundamental premise of the Nuclear Regulatory Commission's (NRC) nuclear facility licensing and inspection program is that a licensee is responsible for the proper construction and safe operation of nuclear power plants. The total government-industry system for the inspection of nuclear facilities has been designed to provide for multiple levels of inspection and verification. Licensees, contractors, and vendors each participate in a quality verification process in accordance with requirements prescribed by, or consistent with, NRC rules and regulations. The NRC inspects to determine whethers its requirements are being met by a licensee and his contractors, while the great bulk of the inspection activity is performed by the industry within the framework of sequential ongoing quality verification programs.

In implementing this multilayered approach, a licensee is responsible for developing a detailed quality assurance plan as part of his license application. This plan includes the quality assurance programs of the licensee's contractors and vendors. The NRC reviews the licensee's and contractor's quality assurance program would be satisfactory and responsive to NRC regulations.

Firms designing nuclear steam supply systems, architect engineering firms doing design work on nuclear power plants, and certain selected vendors are currently inspected on a regular basis by the NRC. NRC inspectors, during periodic inspections, ascertain through direct observation of selected activities (including review of processes and selected hardware, discussions with employees and selected record review) whether a licensee or contractor is satisfactorily implementing a quality assurance program. If nonconformances with QA commitments are found, the inspected organization is requested to take appropriate corrective action and to institute preventive measures to preclude recurrence.

In addition to the QA program inspections, NRC also conducts reactive inspections of the licensee's contractors and vendors. These are special, limited scope inspections to verify that organizations supplying safety-related equipment or services to licensed facilities are exercising appropriate corrective/preventive measures when defects or conditions which could adversely affect the safe operation of such facilities are identified and that these organizations are complying with the NRC requirements which govern the evaluation and reporting of such conditions.

In the case of the principal licensee contractors, such as nuclear steam supply system designers and architect engineering firms, the NRC encourages submittal of a description of corporate-wide quality assurance programs for review and acceptance by the NRC office of Nuclear Reactor Regulation (NRR). Upon acceptance by NRR, described quality assurance programs provide written bases for inspection on a generic basis, rather than with respect to specific commitments made by a particular licensee. Once accepted by NRR, a corporate quality assurance program of a licensee's contractor will be acceptable for all license applications that incorporate the program by reference in a Safety

Analysis Report. In such cases, a contractors's quality assurance program will not be reviewed by NRR as part of the licensing review process, provided that the incorporation in the SAR is without change or modification. However, new or revised regulations, Regulatory Guides, or Standard Review Plans affecting quality assurance program controls may be applied by NRR to previously accepted quality assurance programs.

The NRC Region IV Office in Arlington, Texas, inspects the implementation of quality assurance programs of nuclear steam supply system designers and architect engineering firms which have been submitted to, and approved by, NRR in the form of Topical Reports or Standardized Programs. Upon completion of inspections confirming satisfactory implementation of QA programs, NRC will issue a confirming letter to the nuclear steam system supplier or architect engineering firm.

Licensing and applicants that have referenced the NRR approved Topical Report, or Standardized Program, in Safety Analysis Reports (or have adopted the total quality assurance program described in the Topical Report or Standardized Program) may, at their option, use the confirming letter to fulfill their obligation under 10 CFR Part 50, Appendix B, Criterion VII, that requires them to perform initial source evaluation audits and subsequent periodic audits to verify quality assurance program implementation. For additional details concerning the NRC letter, refer to "SAMPLE LETTER" included in this report.

Licensees or construction permit holders may choose not to make use of a contractor's NRC accepted program, or such an accepted program may not exist. In such cases, the Region IV inspections of nuclear steam supply system designers, architect engineering firms, or other licensee contractors, sub-tier contractors, or suppliers, will be based on programs developed to meet the commitments made by the licensee or construction permit holder. These Region IV inspections will be relieve the licensee or applicants from any inspection/verification responsibilities required by Criterion VII.

The NRC currently is continuing their evaluation of proposed program for NRC acceptance of third-party (ASME) certification of Vendor Quality Assurance programs. Should the proposed program be endorsed by NRC, it is anticipated that, subject to NRC audits of the third-party program, licensees and applicants would be able to use the ASME nuclear certification and inspection system to fulfill that part of their obligation under 10 CFR Part 50, Appendix B, Criterion VII, which required them to perform initial source evaluation/selection audits and subsequent periodic audits to assess the quality assurance program implementation.

A third party category of firms consists of organizations whose quality assurance programs or manufacturing processes have not been reviewed and approved by NRR, or by a third party (such as ASME). This category of firms is subject to NRC inspection based on the safety significance and performance of products or services provided by such firms. Since such firms will not receive a thrid-party review of their QA programs, results of the direct NRC inspections may not be used to fulfill the licensee's obligations under Criterion VII.

The White Book contains information normally used to establish a "qualified suppliers" list; however, the information contained in this document is not adequate, nor is it intended to stand by itself as a basis for qualification of suppliers.

Correspondence with contractors and vendors relative to the inspection data contained in the White Book is placed in the USNRC Public Document Room, located in Washington, D.C.

Copies of the White Book may be obtained at a nominal cost by writing to the National Technical Information Service, Springfield, Virginia, 22161.

ORGANIZATION: COMPANY, DIVISION
CITY, STATE

REPORT NO.: Docket/Year Sequence	INSPECTION DATE(S)	INSPECTION ON-SITE HOURS:

CORRESPONDENCE ADDRESS: Corporate Name
Division
ATTN: Name/Title
Address
City/State/Zip Code

SAMPLE PAGE
(EXPLANATION OF FORMAT AND TERMINOLOGY)

ORGANIZATIONAL CONTACT: Name/Title
TELEPHONE NUMBER: Telephone Number

PRINCIPAL PRODUCT: Description of type of components, equipment, or services supplied.
NUCLEAR INDUSTRY ACTIVITY: Brief statement of scope of activity including percentage of organization effort, if applicable.

ASSIGNED INSPECTOR: Signature _____ _____
Name/VPB Section Date

OTHER INSPECTOR(S): Name/VPB Section

APPROVED BY: Signature _____ _____
Name/VPB Section Date

INSPECTION BASES AND SCOPE:

A. BASES: Pertain to the inspection criteria that are applicable to the activity being inspected, i.e., 10 CFR Part 21, Appendix B, and SAR or Topical Report commitments.

B. SCOPE: Summarizes the specific QA program areas that were reviewed, and/or identifies plant systems, equipment or specific components that were inspected. For reactive (identified problem) inspections, the scope summarized the problem that caused the inspection to be performed.

PLANT SITE APPLICABILITY: Lists docket numbers of licensed facilities for which equipment, services or records were examined during the inspection.

ORGANIZATION: COMPANY, DIVISION
CITY, STATE

REPORT NO.:	INSPECTION RESULTS:	PAGE 2 of 2

A. VIOLATIONS: Shown here are any inspection results determined to be in violation of Federal Regulations (such as 10 CFR Part 21) that are applicable to the organization being suspected.

B. NONCONFORMANCES: Shown here are any inspection results determined to be in nonconformance with applicable commitments to NRC requirements. In addition to identifying the applicable NRC requirements, the specific industry codes and standards, company QA Manual sections, or operating procedures which are used to implement these commitments may be referenced.

C. UNRESOLVED ITEMS: Shown here are inspection results about which more information is required in order to determine whether they are acceptable items or whether a Violation or Nonconformance may exist. Such items will be resolved during subsequent inspections.

D. STATUS OF PREVIOUS INSPECTION FINDINGS: This section is used to identify the status of previously identified Violations, items or Nonconformance and/or Unresolved Items until they are closed by appropriate action. For all such items, and if closed, include a brief statement concerning action which closed the item. If this section is omitted, all previous inspection findings have been closed.

E. OTHER FINDINGS OR COMMENTS: This section is used to provide significant information concerning the inspection areas identified under "Inspection Scope." Included are such items as mitigating circumstances concerning a Violation or Nonconformance, statements concerning the limitations or depth of inspection. (Sample Size, type of review performed) and special circumstances or concerns identified for possible follow up. For reactive inspections, this section will be used to summarize the disposition or status of the condition or event which caused the inspection to be performed.

SAMPLE PAGE
(EXPLANATION OF FORMAT AND TERMINOLOGY)

CONTRACTORS WITH NRC LETTERS CONFIRMING QA PROGRAM IMPLEMENTATION

(See Next Page for example of Confirming Letters)

Contractor	Topical Report	Revision	Date of NRC Letter
Babcock & Wilcox	BAW 10096A	Revision 1	December 30, 1975
Stone & Webster	SWSQAP 1-74	Revision A	December 30, 1975
Westinghouse NTD	WCAP-8370	Revision 9A	April 30, 1981
Bechtel-Gaithersburg	BQ-TOP-1	Revision 3A	November 2, 1981
Bechtel-San Francisco	BQ-TOP-1	Revision 3A	June 12, 1981
Ebasco-Services, Inc.	ETR-1001	Revision 8A	March 31, 1980
Combustion Engineering	CENPD-210-A	Revision 3	June 2, 1981
Gibbs & Hill, Inc.	GIBSAR 17-A	Amendment 2	March 31, 1977
United Engineers & Constructors	UEC-TR-001-3A	Amendment 5	March 31, 1977
General Electric Co.	NEDO-11209-04A	N/A	March 30, 1979
Sargent & Lundy Engineers	SL-TR-1A	Revision 5	May 17, 1979
Bechtel-Los Angeles	BQ-TOP-1	Revision 3A	December 20, 1982
Gilbert-Commonwelath	GAI-TR-106	Revision 2A	February 2, 1981
Bechtel-Ann Arbor	BQ-TOP-1	Revision 2A	May 7, 1981

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TEXAS 76011

(ADDRESSEE)

Gentlemen:

A series of Nuclear Regulatory Commission (NRC) inspections have been conducted to review your implementation of the Quality Assurance Program applicable to NRC applicants or licensees who have contracted for services from the (applicable corporate entity). These inspections consisted of selective examination of procedures and representative records, interview of personnel, and direct observation by the inspectors. As a result of these inspection, the NRC has concluded that the QA program described in Topical Report _____ is being implemented satisfactorily. Neither this conclusion nor the remainder of this letter applies to manufacturing activities or construction related activities conducted at reactor sites.

Licensees and applicants that have referenced the above Topical Report in their Safety Analysis Reports (or have adopted the total quality assurance program described in that Topical Report) may, at their option, use this letter to fulfill their obligation under 10 CFR Part 50, Appendix B, Criterion VII, that requires them to perform initial source evaluation/ selection audits and subsequent periodic audits to assess the quality assurance program implementation.

The NRC expression of satisfaction with the implementation of your QA program does not assure that a specific product or service offered by you to your customer is of acceptable quality, nor does it relieve the applicant or licensee from the general provision of Criterion VII which requires verification that purchased material, equipment, or services conform to the procurement documents. It is recognized that in some cases this assurance can be made by the applicant or licensee without audits or inspections at your facility.

Continuing acceptability of implementation of your QA program is contingent upon your maintaining a satisfactory level of program implementation, certified through periodic NRC inspection, throughout all corporate organization units and nuclear projects encompassed by your program. Should your program implementation at any time be found unacceptable you will be notified by letter and requested to correct the deficiencies promptly. In the

event you fail to correct the deficiencies promptly, or if the record of deficiencies is such as to indicate generally poor program implementation, you and the applicants and licensees who have referenced your QA program will be notified that the generic implementation of your program is no longer acceptable to the NRC. All of the audit/inspection requirements of Criterion VII, Appendix B, 10 CFR Part 50, must then be implemented by the applicants or licensees. The NRC will reinstate its letter of acceptability of implementation of your QA program only after our inspectors have concluded, based on reinspection, that you have again demonstrated full compliance.

Except as noted above, the conclusions expressed in this letter will be effective for three years from the date of issue of the letter. At that time, program performance over the previous three year period will be evaluated and this letter reissued, if appropriate.

The results of our inspection are published quarterly in the Licensee Contractor and Vendor Inspection Status Report (NUREG 0040), which is made available to NRC facility applicants, licensees, contractors, and vendors as well as to members of the public, by subscription.

Sincerely,

Regional Administrator

ORGANIZATION: ACME-CLEVELAND DEVELOPMENT COMPANY
HIGHLAND HEIGHTS, OHIO

REPORT NO.: 99900910/82-01	INSPECTION DATE(S) 7/12-15 & 26-29/82	INSPECTION ON-SITE HOURS: 104

CORRESPONDENCE ADDRESS: ACME-Cleveland Development Company
ATTN: T. J. Skingle
Manager
625 Alpha Drive
Highland Heights, OH 44143

ORGANIZATIONAL CONTACT: T. J. Skingle, Manager
TELEPHONE NUMBER: (216) 473-0300

PRINCIPAL PRODUCT: Environmental Qualification Testing of NAMCO Limit Switches

NUCLEAR INDUSTRY ACTIVITY: The ACME-Cleveland Development Company (ACDC) is the research center for the ACME-Cleveland Corporation and provides Class 1E equipment qualification test services for limit switches manufactured by its sister company, NAMCO Controls, Inc. ACDC's test capabilities include thermal aging, seismic vibration, and loss-of-coolant accident (LOCA) environment.

ASSIGNED INSPECTOR: G. T. Hubbard for 10/13/82
J. R. Agee, Equipment Qualification Section (EQS) Date

OTHER INSPECTOR(S): G. T. Hubbard, EQS
J. J. Benson, Consultant, Sandia National Laboratories

APPROVED BY: H. S. Phillips 10/13/82
H. S. Phillips, Chief, EQS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: The inspection was conducted to determine: (1) whether ACDC has an implemented QA program commensurate with applicable criteria from 10 CFR Part 50, Appendix B; (2) whether ACDC has a test facility capable of testing to a simulated LOCA environment; and (3) whether test data can be substantiated.

PLANT SITE APPLICABILITY:

50-358, 50-352, 50-382, 50-329, 50-395, 50-334, 50-354, 50-327, 50-440, 50-237

ORGANIZATION: ACME-CLEVELAND DEVELOPMENT COMPANY
HIGHLAND HEIGHTS, OHIO

REPORT NO.: 99900910/82-01	INSPECTION RESULTS:	PAGE 2 of 7

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

1. ACDC management committed to establish, within approximately 30 days, a separate QA program responsive to applicable parts of 10 CFR 50, Appendix B, which would cover their qualification testing acitivities.

2. Qualification Test Report (QTR) 105 and existing calibration files are contradictory concerning calibration frequency of the Shure Model 62 CP Accelerometer. Records of the ACDC calibration contractor will be reviewed to verify the required calibration frequency.

3. The witnessing of tests for the QA manager by the same person who approved the NAMCO Qualification Test Plan (QTP) and who compiles and approves the QTR is contrary to the QA philosophy of 10 CFR Part 50, Appendix B, which states that inspections shall be performed by individuals other than those who performed the activity being inspected.

D. OTHER FINDINGS OR COMMENTS:

1. General - ACDC is a broadbased research and development (R&D) facility engaged in solving technological problems. It has 53 employees of which 25 are management and professional personnel. Its involvement in the nuclear industry is limited to the Materials Department where four members, two professional and two technicians, are dedicated to the qualification testing of NAMCO Controls, Inc. (NAMCO), electrical limit switches. LOCA testing is conducted in accordance with qualification test plans (QTP) prepared by NAMCO.

   ACDC has conducted equipment qualification testing for NAMCO for approximately 7 years, or since the publication of IEEE 323-1974. In this relationship, NAMCO provides the test specimen, engineering services, and dictates the conditions under which the ACDC qualification tests will

be conducted. ACDC conducts the test and submits a final report to NAMCO. The final ACDC test report is included in the NAMCO QTR which supports the NAMCO certification that the NAMCO limit switch met the test criteria of IEEE Standards 323-1974, 344-1975, and 382-1972.

ACDC and NAMCO are members of the ACME-Cleveland Corporation. NAMCO corporate and manufacturing facilities occupy separate sites in remote locations from the ACDC facility; however, members of the NAMCO engineering department occupy space in the ACDC building.

A portion of the NAMCO engineering department participates in the preparation of QTP's, in the review and witnessing of tests, in decisions concerning test anomalies, and in the preparation of final QTR's.

2. Test Facility - The ACDC LOCA test facility has demonstrated the capability to simulate environmental conditions more severe than required by applicable IEEE standards for nuclear components operating in a harsh environment. The facility was designed by ACDC engineering specifically to test NAMCO limit switches installed in a horizontal position. In addition, the LOCA chamber has the capability for testing all specimens electrically energized while being mechanically operated.

   Other features of the ACDC test facility include thermal aging ovens where thermal aging and wear aging of the NAMCO limit switches can be conducted simultaneously. Seismic and vibration capabilities exist for small components; however, a larger vibration unit will be installed in mid to late 1982. ACDC has environmentally tested no equipment except NAMCO limit switches.

3. Quality Assurance - ACDC had not established a formal QA program which would include procedures which would describe how the applicable 10 CFR Part 50, Appendix B, criteria were to be implemented.

   In the NRC entrance meeting at ACDC on July 12, 1982, ACDC/NAMCO management collectively stressed the position that ACDC's QA program is essentially covered under the grandfather clause of the NAMCO QA program. During the NRC inspections of July 12-15 and 26-29, 1982, the NRC inspector reviewed the NAMCO QA program and found that

the manual did not describe the organizational relationship between ACDC and NAMCO. The manual did not describe how ACDC would meet the applicable criteria of 10 CFR Part 50, Appendix B.

In the absence of an auditable QA program or procedures, the inspector requested ACDC to provide any correspondence, minutes of meetings, intrafacility (ACDC/NAMCO) memoranda or purchase orders that reflect a required contractual working relationship between ACDC and NAMCO regarding QA and test controls. No purchase orders were identified.

Also, no memoranda described a QA program to be imposed on ACDC by NAMCO.

The NRC inspectors determined that ACDC had received a written test plan/procedure from NAMCO and had implemented a system to control the calibration of test equipment based on an agreement between ACDC and NAMCO; however, there were no written procedures describing the system. NAMCO's calibration requirements on ACDC are defined in two ACDC Research and Development Program Proposal and Authorization forms, entitled Nuclear Test System Maintenance, dated March 20, 1981, and June 24, 1982, respectively. These documents require ACDC to maintain test instrumentation calibrated and traceable to the National Bureau of Standards (NBS).

ACDC management recognized that a QA program must be established to meet requirements of 10 CFR Part 50, Appendix B, and orally committed to establish a QA program within approximately 30 days following the exit management meeting. Implementation of the program will occur in a reasonable time. This matter is an unresolved item (8201-01).

4. Calibration

The NRC inspectors visually inspected test instrumentation used in the nuclear test areas and determined that the instruments were tagged and calibrated within the prescribed frequency. The nuclear calibration records contained the history of all instrumentation used for nuclear equipment qualification testing. The calibration was traceable to NBS. The records included individual instrument files as well as overall log sheets which recorded the dates of last calibration and indicated when the next calibration would be due.

The records indicated that all instrumentation, except for some thermocouples, were calibrated by sources outside of ACDC. Calibration procedures were in the files for the thermocouple calibrations performed in-house.

During the inspection, a review of QTR 105, Revision 3, dated August 20, 1981, and QTR 111, dated October 1, 1981, was made concerning calibration adequacy. Appendix D, Data Sheets, and Appendix E, Equipment Calibration of QTR 105, data indicated the seismic testing data sheet was signed January 2 and 3, 1980; whereas, the Shure Model 62 CP Accelerometer was calibrated July 1977. This was the only accelerometer listed in the QTR appendix. This calibration data appears to be inconsistent because the calibration files indicate the accelerometer calibration frequency should be every 6 months; however, the dates on test documentation indicate the actual calibration interval was 30 months.

ACDC test personnel agreed to review their records and to provide additional calibration data on the Shure Accelerometer from their outside calibration contractor, but that data was unavailable at the ACDC site before end of the inspection. This matter is an unresolved item (8201-02).

5. Qualification Test Plan - The NRC inspector reviewed the thermal aging and radiation analyses described in the QTP 207, dated May 14, 1982, and discussed the plan with the NAMCO Project Engineer. The following comments were made relative to QTP 207.

   a. Reference information available on activation energies of the nonmetallic components of the limit switches was limited. However, a review of the reference information indicates the assumed activation energy of 0.8eV is reasonable and conservative for the following reasons:

      1) No activation energy of less than 0.8eV was noted during the review of the available literature; and

      2) IEEE Standard 382-1980, "Safety Related Valve Actuators," paragraph 5.5.4 bases qualified life calculations on an activation energy of 0.8eV. Appendix C of the IEEE Standard also uses 0.8eV for illustrative purposes. By inference, this indicates that using 0.8eV is conservative.

b. The Arrhenius calculation used by NAMCO to establish a 10-year limit switch life prior to maintainence was verified. The 1000-hour aging at 120° C yields an equivalent life of 12+ years. If a 10-year life equivalent to 1000 hours test time is assumed, this would yield an activation energy of approximately 0.765eV.

c. Radiation aging required by QTP 207 is 204 megarads-at a rate of .5 to 1.0 megarad/hour. IEEE 382-1980, Case III (which is the worst case for radiation) specified 190 megarads total for 40 years aging and DBE radiation exposure. NAMCO calculations are acceptable.

d. NAMCO has established several test programs to investigate thermal aging characteristics of materials used in their limit switches. If the results of this testing indicate the activation energies of any materials are less than 0.8eV or if future information indicates that 0.8eV is not a conservative activation energy, required qualification time for the limit switches should be adjusted accordingly.

6. Test Witnessed - QTP 208, Revision 3, dated July 2, 1982, and related test logs dated February 3, 1982, through June 11, 1982, were examined. The QTP and test logs related to tests conducted for Combustion Engineering, Inc., and covered test plan sequences performed by ACDC from the limit switch of the initial inspection through postseismic test performance.

Design Basis Event (DBE) testing (in accordance with QTP 208) of limit switch No. 214-H, S/N 3137, started at approximately 1:40 p.m., July 28, 1982. Three anomalies were observed during the early stages of the test:

a. A commercial power failure occurred and lasted approximately 45 minutes. During the power outage, test chamber pressure and temperature levels dropped below test plan margins, but returned to normal upon resumption of power. Testing was continued from that point.

b. Chemical spray was lost for approximately 4 to 5 hours; however, test chamber pressure and temperature were maintained.

c. One of four circuits to the limit switch exhibited a low current reading during early stages of the test.

The above anomalies were entered in the test log, but had not been evaluated. These anomalies will be reviewed during the next inspection.

The NAMCO QA manager exercised his prerogative to waiver witnessing the test by submitting a telex dated July 28, 1982. NAMCO personnel located at the test site were authorized to represent him. The NAMCO representative who witnessed the test was the same person who approved the NAMCO QTP and who compiles and approves the QTR. This is contrary to the QA philosophy of 10 CFR Part 50, Appendix B, which states that inspections shall be performed by individuals other than those who performed the activity being inspected. This matter is an unresolved item (8201-03).

ACDC methodology for conducting the test adhered to the QTP test procedure.

ORGANIZATION: ALFAB, INCORPORATED
ENTERPRISE, ALABAMA

REPORT NO.: 99900787/82-01	INSPECTION DATE(S) 8/9-12/82	INSPECTION ON-SITE HOURS: 27

CORRESPONDENCE ADDRESS: ALFAB, Incorporated
ATTN: Mr. R. S. Sanford
President
P. O. Box 1334
Enterprise, Alabama 36331

ORGANIZATIONAL CONTACT: Mr. B. Grantham - Quality Assurance Manager
TELEPHONE NUMBER: (205) 347-9516

PRINCIPAL PRODUCT: Structural Steel Fabrication

NUCLEAR INDUSTRY ACTIVITY: The ALFAB, Incorporated (AI), contribution to the nuclear industry represents approximately 30 percent of its total workload.

ASSIGNED INSPECTOR: Wm D. Kelley — 9/30/82
W. D. Kelley, Reactive & Component Program Section (R&CPS) — Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes — 10/4/82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21 and 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made as a result of three construction deficiency reports by Carolina Power and Light Company concerning the welding of concrete embedded plates, crane rail embedded plates, and conduit seismic support members supplied to the Shearon Harris Nuclear Power Plant, Units 1 and 2. Additionally, the following areas were inspected: quality assurance program; and control of special processes-welding.

PLANT SITE APPLICABILITY:

50-400 and 50-401

ORGANIZATION: ALFAB, INCORPORATED
ENTERPRISE, ALABAMA

REPORT NO.: 99900787/82-01	INSPECTION RESULTS:	PAGE 2 of 8

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50, Carolina Power and Light Company Purchase Order No. H-36933, and paragraph 6.8.2.8 of AWS D1.3, two welders, who were listed on the AI Inspection Report (Form 12) as having performed welding on galvanize coated conduit seismic support members, had not been qualified as required by paragraph 6.8.2.8 of AWS D1.3.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and paragraphs 9.1.6 and 12.1.9.3 of the AI Quality Assurance Policy Manual, weld gages on a Lincoln welding machine (Model R3S-600) had not been calibrated.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraph 5.1 of the AI welding procedure specification W-001 and paragraph 4.2.6.2 of the AWS D1.1 Code, required numbers of stud bend tests were not performed, as evidenced by: (a) only 21 bend tests were performed on the January 15, 1982, shipment of embedded strip plates which contained 4476 studs; (b) only 20 bend tests were performed on the January 19, 1982, shipment of embedded strip plates, which contained 3836 studs; and (c) only 19 bend tests were performed on the January 28, 1982, shipment of embedded strip plates, which contained 2376 studs.

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50, Carolina Power and Light Company Purchase Order No. H-36933 and paragraph 5.3.1 of the AWS D1.1 Code, an AI employee, who had not been qualified by test, was observed tack welding on a fabrication for Job No. 321357.

C. UNRESOLVED ITEMS:

An AI memorandum dated March 15, 1982, was presented to the NRC inspector at the conclusion of the inspection, which gave instructions that the galvanize coating was to be removed from strut weld areas by grinding. Compliance with these instructions will be ascertained during a subsequent inspection.

ORGANIZATION: ALFAB, INCORPORATED
ENTERPRISE, ALABAMA

REPORT NO.: 99900787/82-01	INSPECTION RESULTS:	PAGE 3 of 8

D. OTHER FINDINGS OR COMMENTS:

1. Carolina Power and Light Company (CP&L): Shearon Harris Nuclear Power Plant, Units 1 and 2.

a. Problem reported was stud separation in 59 of 1001 plates tested.

(1) Background:

CP&L notified the NRC on February 16, 1982, that stud separation occurred in 59 of 1001 concrete embedded strip plates. On March 19, 1982, CP&L submitted their final report of the deficiencies in welded studs, in accordance with the requirements of 10 CFR Part 50.55(e).

(2) Findings:

CP&L placed their Purchase Order No. 22AA8, dated December 23, 1981, with AI for 1950 concrete embedded strip plates, which varied in length from 1 to 4 feet. The plates were to be fabricated in accordance with CP&L Drawing No. MPS-B-838, which required 3/4-inch diameter by 7-inch long Nelson Studs, Type S3L, or approved equal to be welded to the plates.

The fabrication of the 1950 plates had been completed and shipped by AI and the 59 plates returned by CP&L had been repaired by AI and shipped back to the Shearon Harris Nuclear Power Plant prior to the NRC inspection; therefore, the NRC inspector could not visually verify the exact nature of the stud failures, but did verify that CP&L had waived source inspection.

The NRC inspector reviewed CP&L Deficiency and Disposition Reports DDR No. 806 and No. 812, the CP&L final 10 CFR Part 50.55(e) report, and AI Inspection Reports for the 59 deficient plates.

The NRC inspector verified that CP&L: (1) DDR No. 806 stated, that during receipt inspection of 400 studs for 360° flash, one stud was bent 30° and failed; and (2) DDR No. 812 identified that the majority of the 59 embedded plates were rejected because of undercut of the stud welds, with some of the plates also being rejected because of lack of fusion of the stud

welds. The CP&L 10 CFR Part 50.55(e) final report states that the embedded strip plates contained studs that could not pass the AWS D1.1 specified acceptance test.

The NRC inspector verified that the AI welding procedure specification W-001, Revision 1, for stud welding had been qualified in accordance with the requirements of AWS D1.1 and was listed on the AI Inspection Reports as the applicable welding procedure specification used for the stud welding.

AI evaluated that high humidity was the cause of defective stud welds and issued a corrective action report to CP&L on March 1, 1982, which stated their corrective action to prevent recurrence of stud weld failure was: (1) on days when the humidity was above 90% the stud welding equipment would be serviced by AI maintenance personnel prior to start of production, and when the humidity had been above 90% during the day when studs were welded, the equipment would be serviced the following morning regardless of the humidity level; and (2) each stud would be hit after welding, hard enough to give it a slight bend, in order to assure complete fusion.

During review of the AI Inspection Reports by the NRC Inspector, one nonconformance was identified (see paragraph B.3). Sixty 15° stud bend tests had been performed on the 10,688 welded studs. Paragraph 4.26.2 of D1.1 and paragraph 5.1 of the AI welding procedure specification W-001 require one bend test for every 100 welded studs, which would necessitate a minimum of 107 bend tests.

The AI quality assurance program did assure that the stud welding procedure specification W-001 had been qualified in accordance with AWS D1.1, but did not preclude the shipment of embedded strip plates with identified defective stud welds and performance of an insufficient number of 15° stud bend tests.

b. Problem reported was 36 of 79 crane rail embedded plates had undercut weld defects.

(1) Background:

CP&L notified NRC on April 29, 1982, that during receipt inspection, 36 of 79 crane rail embedded plates were found

to have undercut weld defects and CP&L was evaluating the item to determine its reportability.

(2) Findings:

CP&L placed their Purchase Order No. H-37507, dated February 19, 1982, for 312 crane rail embedded plates in accordance with their drawing MPS-B-852, Revision 2. The plates were 1½ inches thick by 45 inches long by 22 inches wide, with five 7/8 inch diameter by 8 inches long Type S3L Nelson studs and 5 cadweld splice sleeves (supplied by CP&L) welded to each plate.

AI personnel informed the NRC inspector that CP&L issued their DDR-880 on April 19, 1982, notifying them that 36 of the first shipment of crane rail embedded plates contained weld undercut defects. AI stated that: (1) when their personnel arrived on the Shearon Harris Nuclear Power Plant site, the second week of May 1982, CP&L had received the second shipment of 45 embedded plates and the third shipment of 81 embedded plates was waiting to be unloaded; (2) the 154 embedded plates of the first and second shipments were laid out and the cadweld splice sleeve welds were inspected for undercut using a straight edge and wire feeler gages; (3) 16 embedded plates were rejected because the weld undercut was greater than 0.030 of an inch and returned to the AI, Enterprise, Alabama, plant for repairs; and (4) none of the 77 embedded plates of the fourth and final shipment were rejected by CP&L. Since all embedded plates were onsite, the NRC inspector could not visually verify the depth and magnitude of the weld undercut.

The NRC inspector verified by review of documents that CP&L had waived source inspection.

The NRC inspector reviewed AI welding procedure specification 321BB-1 and verified that it had been accepted by CP&L; however, the AI Inspection Reports stated that the welding was performed in accordance with ALFAB welding procedure specification W-004.

AI personnel informed the NRC inspector that the welding of the cadweld splice sleeve had been performed in accordance with their welding procedure specification 32BB-1 and agreed that their documentation did not confirm their statement.

The AI quality assurance program did not preclude the shipment of crane rail embedded plates with identified defective welds of cadweld sleeves and the AI Inspection Reports recording that welding procedure specification W-004 had been used, rather than the customer accepted welding procedure specification 32BB-1.

c. Problem reported was 87 of 309 conduit support assemblies had undercut weld deficiencies.

(1) Background:

CP&L notified NRC on May 5, 1982, of a potential construction deficiency, 87 of 309 conduit support assemblies received from AI had undercut weld deficiencies.

(2) Findings:

CP&L placed their Purchase Order No. H-36933, dated January 19, 1982, for 600 conduit seismic support members in accordance with their Drawing No. MPS-B-845, Revision 2, and Site Specification No. 025. The conduit seismic support members were fabricated from 3 inch square ASTM A-500, Grade B, tubing with a B-Line System, Inc., galvanized strut, Size B-52, welded to it with 1/8 inch skip fillet welds. The CP&L purchase order requires the welding to be in accordance with AWS D1.1 and AWS D1.3.

The NRC inspector verified that CP&L had waived final source inspection of the conduit seismic support member and that all support members had been shipped to the Shearon Harris Nuclear Power Plant.

AI personnel informed the NRC inspector that the first shipment of conduit seismic support members had been returned from the site and scrapped. Additionally, all support members had been shipped, which precluded direct verification by the NRC inspector of the magnitude of the weld deficiencies.

Paragraph 6.8.2.8 of AWS D1.3 requires welders welding on galvanized sheet steel to be qualified using galvanized material. One nonconformance was identified by the NRC

inspector (see paragraph B.1) as a result of the identification that two welders were listed on the AI Inspection Report for the first shipment of support members (which did not have the galvanized coating removed in the weld areas), who had not been qualified for welding on galvanized coated steel.

AI personnel informed the NRC inspector that the galvanized coating had been removed in the weld area of the replacement support members for the first shipment and all subsequent shipments; however, no documentation was made available during the inspection, which would substantiate that the galvanize coating had been removed. After the exit interview, the AI personnel presented to the NRC Inspector an internal memorandum, dated March 15, 1982, which gave instructions that the galvanize coating was to be removed from the struts by grinding.

Compliance with this internal memorandum will be ascertained during a subsequent inspection by review of applicable process and inspection documentation. This item is considered unresolved (see paragraph C.).

CP&L accepted AI welding procedure specification 22CC-1; however, AI Inspection Reports stated that the support members were welded in accordance with AI welding procedure specification W-004, Revision 7.

The AI quality assurance program did not preclude the shipment of conduit seismic support members with identified defective welds, unqualified welders welding on galvanize coated steel, and the AI Inspection Report recording that welding procedure specification W-004 had been used, rather than the customer accepted welding procedure specification 22CC-1.

2. Control of Special Processes-Welding:

Reviewed Sections 9 and 12 of the AI Quality Assurance Policy Manual, five welding procedures, three welder qualifications, and observed fabrication and welding in progress.

Two nonconformances were identified as a result of the observations by the NRC inspector of: (a) An AI employee, who had not been qualified in accordance with the requirements of AWS D1.1, was

observed tack welding on a fabrication for Job No. 321357 (see paragraph B.4); and (b) the weld gages on a Lincoln welding machine, Model R3S-600, which was located in the bay where nuclear work was in progress, had not been calibrated (see paragraph B.2).

The NRC inspector additionally noted, that the use of an unqualified tack welder had not been identified by the AI Quality Assurance Inspector, although present in the immediate area where the activity was being performed.

3. Review of QA Program:

Reviewed: (a) the AI Quality Assurance Policy Manual; (b) implementing procedures for receiving inspection, shop inspection, and welding and nondestructive testing procedures; and (c) the documentation of inspection, welding, and calibration. The NRC inspector identified that the quality assurance program was not being fully implemented, as evidenced by the nonconformances identified in Section B of this report.

ORGANIZATION: ACTON ENVIRONMENTAL TESTING CORPORATION
ACTON, MASSACHUSETTS

REPORT NO.: 99900912/82-01	INSPECTION DATE(S) 8/30-31/82	INSPECTION ON-SITE HOURS: 48

CORRESPONDENCE ADDRESS: Acton Environmental Testing Corporation
ATTN: Mr. R. S. Cowdrey
President
533 Main Street
Acton, MA 01720

ORGANIZATIONAL CONTACT: Mr. R. S. Cowdrey, President
TELEPHONE NUMBER: (617) 542-0237

PRINCIPAL PRODUCT: Laboratory Testing Services.

NUCLEAR INDUSTRY ACTIVITY: Acton Environmental Testing Corporation (AETC) provides testing services for commercial, military, and nuclear power industry customers. Approximately 45% of their capacity is used for nuclear power testing.

ASSIGNED INSPECTOR: J. R. Agee — 12/7/82
J. R. Agee, Equipment Qualification Section (EQS) — Date

OTHER INSPECTOR(S): H. S. Phillips, EQS
G. T. Hubbard, EQS
N. B. Le, IE

APPROVED BY: H. S. Phillips — 12/7/82
H. S. Phillips, Chief, EQS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and 10 CFR Part 21.

B. SCOPE: The purpose of the inspection was to: (1) conduct a management meeting to explain the RIV Equipment Qualification (EQ) program and obtain information about the AETC organization; (2) tour the facility and evaluate its capability for conducting EQ tests; and (3) obtain information concerning projected test schedules.

PLANT SITE APPLICABILITY:

AETC currently has scheduled tests of Masoneilan valve positioners for 50-382.

ORGANIZATION: ACTON ENVIRONMENTAL TESTING CORPORATION
ACTON, MASSACHUSETTS

REPORT NO.: 99900912/82-01	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

Contrary to paragraph 21.31, "Procurement Documents," AETC failed to specify the provisions of 10 CFR Part 21 in each procurement document for a basic component issued on or after January 6, 1978.

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Initial Management Meeting - The accompanying Region IV supervisor made a presentation to AETC management to describe and explain the Region IV Equipment Qualification Inspection Program. The presentation covered NRC and Region IV organizations, bases for inspection, history of the EQ program, and status of proposed rules being developed and in the adoption process. NRC fact sheets, organization charts, and other handouts were provided to AETC management.

   Following the NRC presentation, AETC management made a presentation describing AETC organizational structure, facility equipment and locations, test capability, and operations. In addition, other facility specialty services were described; for example, design, machining, and fabrication of test fixtures and auxiliary support equipment. AETC stated that they have heavy commitments to conduct environmental qualification tests of safety-related equipment which may be exposed to a harsh environment.

   The NRC inspectors toured the test facility to determine the extent of testing in progress and test capability.

2. General - The AETC is a multitechnical testing laboratory that provides testing services to commercial, military, and commercial nuclear power industries. It has the equipment, facilities, and technical personnel to conduct environmental qualification tests to meet the test criteria of IEEE Standard 323-1974 and applicable daughter standards and NUREG 0588, Revision 1, except for radiation aging. All radiation aging testing is subcontracted to a qualified laboratory or institution.

AETC has approximately 90 employees of which about 60 are technical/ management. About 45 percent of the volume of testing is for the commercial nuclear industry. The laboratory has committed its facility to continued nuclear equipment qualification testing, much of which will be completed in a loss-of-coolant accident (LOCA) environment.

3. Review of QA Requirements - The NRC inspectors reviewed Bechtel Corporation's purchase order No. (PO) 9645-J-312.1, Masoneilan's Division PO 57955, and Magnetrol's PO 10077 which were issued to AETC.

   Only one (Bechtel's PO) of the three purchase orders reviewed imposed 10 CFR Part 50, Appendix B and 10 CFR Part 21 requirements on AETC relative to testing nuclear components in the harsh environment (NUREG 0588, IEEE 323-1974, and IEEE 344-1975).

   The NRC inspectors then requested purchase orders issued by AETC. AETC PO 15173-A issued to Isomedix, Inc., an irradiation test facility, did not impose 10 CFR Part 21 and 10 CFR Part 50, Appendix B requirements for testing AR Relays (AETC Nos. 85, 86, 89, 97, 115, and 116) and Weed resistance temperature devices (2541 and 2574). (See Violation A.)

4. Reviews of Established and Implemented QA Program - The laboratory has an AETC management approved QA Manual based on selected portions of Military Specifications MIL-Q-9858A, MIL-STD-45662A, and the Nuclear Regulatory Commission document 10 CFR Part 50, Appendix B.

   The NRC inspectors reviewed the implementation of selected QA functions during the inspection, namely:

   a. Personnel Qualification (Training Records) - A random selection of personnel folders were examined. Each contained records of the individual's experience and progressive training he/she had received at AETC to qualify for his/her current position rating and job assignments.

   b. Document Control - The QA Manual describes a means for controlling drawings and specifications for specific jobs. Separate AETC standard operating procedures (SOP) (e.g., SOP April 1982, "Document Control") were examined. The QA Manual does not allude to the existence of these SOP's or take credit for their use in the total QA program.

ORGANIZATION: AUTOMATIC SWITCH COMPANY
FLORHAM PARK, NEW JERSEY

REPORT NO.: 99900369/82-01	INSPECTION DATE(S) 10/12-14/82	INSPECTION ON-SITE HOURS: 24

CORRESPONDENCE ADDRESS: Automatic Switch Company
ATTN: Mr. E. R. Ehrhard
President
50-56 Hanover Road
Florham Park, New Jersey

ORGANIZATIONAL CONTACT: Mr. L. S. Olsen, Quality Control Manager
TELEPHONE NUMBER: (201) 966-2350

PRINCIPAL PRODUCT: Solenoid Valves and Transfer Switches

NUCLEAR INDUSTRY ACTIVITY: Commercial nuclear production of the Automatic Switch Company (ASCO) totals 3% of the company's production.

ASSIGNED INSPECTOR: J. W. Sutton — 11/5/82
J. W. Sutton, Reactive & Component Program Section (R&CPS) — Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes — 11/5/82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and 10 CFR Part 21.

B. SCOPE: Management meeting, quality control organization, 10 CFR Part 21 inspection, and assembly and test.

PLANT SITE APPLICABILITY:

Not Identified

ORGANIZATION: AUTOMATIC SWITCH COMPANY
FLORHAM PARK, NEW JERSEY

REPORT NO.: 99900369/82-01	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATIONS:

Contrary to Section 21.21 of 10 CFR Part 21, procedures had not been adopted to provide for: (1) evaluating deviations or informing the licensee or purchaser; and (2) assuring that a director or responsible officer was informed if the supplied basic component (a) failed to comply, or (b) contained a defect.

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and subparagraph 1.6.1 of Section 1 of the Quality Control Manual, revisions (pertaining to use of posting cards) to Production Planning and Control Department Procedure No. PP 468 were made and implemented in the fabrication process, without notifying or forwarding to the Quality Control Department for incorporation in their files.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 11 of Section 11 of the Quality Control Manual, Shop Order (SO) Nos. 83943K, 81783K, and 75367K were processed through final assembly and testing without verification of required personnel signoff on the back of the SO's. It was additionally noted that Quality Control audits performed during the past 12 to 15 months, had not detected failures to make required signoffs.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Deviation A (Report No. 79-01): Actual calibration findings had not been indicated on Gage Record Cards after recalibration of measuring equipment.

   The NRC inspector reviewed the current Gage Record Card Form No. 1079 which had been revised to no longer require listing of recalibration readings. A sampling of Calibration Record Cards was made and it was established that the new procedure is being followed.

2. (Closed) Deviation B (Report No. 79-01): Posting on the face of SO 44044H had not been changed to reflect the latest change letter of Drawings and Part List No. 206-384.

   The NRC inspector verified that ASCO has assigned one person to handle all nuclear orders. A review of Production Planning and Control Procedure PP 468, revision dated December 3, 1979, was performed by

the NRC inspector. As a result of this review, it was noted that the original system of changing posting cards to the latest change letter had been superseded by a new system. Details of the changes had not been forwarded to Quality Control. This has been identified as a nonconformance (see paragraph B.1 of Inspection Results). It was additionally noted that Procedure 468 had not been formally revised to indicate the new change control system.

3. (Closed) Deviation C (Report No. 79-01): Material being reviewed for possible rework or scrap decisions had not been placed in the enclosed, locked area provided.

   The NRC inspector reviewed the revised Quality Control Procedure MP-I-011, issued August 1979, titled, "Rework and Scrap Control Procedure." The wording in the paragraph pertaining to the rework and scrap area was verified to have been changed to reflect the vendor's reply to this deviation. The area was inspected for compliance and found to be acceptable.

4. (Resolved) Unresolved Item (Report No. 79-01): Manufacturing Process Control - "Construction Used" and "Card Data" had not been completed on the back of several completed SO's.

   During inspection of the status of this item, the NRC inspector noted that the same conditions still existed. This item has been replaced by a nonconformance (see paragraph B.2 of Inspection Results).

E. OTHER FINDINGS OR COMMENTS:

1. Quality Control Organization - The NRC inspector reviewed the current Quality Control Manual for organization and program commitments, Sections 1, 2, 3, and 4. Designated Quality Control procedures and organizational charts were reviewed for compliance with 10 CFR Part 50, Appendix B requirements. The NRC inspector was informed that the internal operations were in the process of being reorganized. As a result of this review, the NRC inspector determined that the ASCO organization and program sections of the Quality Control Manual meet 10 CFR Part 50, Appendix B requirements.

ORGANIZATION: AUTOMATIC SWITCH COMPANY
FLORHAM PARK, NEW JERSEY

REPORT NO.: 99900369/82-01	INSPECTION RESULTS:	PAGE 4 of 4

2. 10 CFR Part 21 Inspection - The NRC inspector reviewed ASCO's policy on reporting of 10 CFR Part 21 items. Posting was checked with respect to 10 CFR Part 21 requirements and found to meet posting requirements. The NRC inspector requested to review ASCO's procedure for evaluation and reporting of defects under the requirements of 10 CFR Part 21. ASCO's personnel indicated that they had issued memoranda regarding this matter, but had not generated a formal procedure to indicate reporting requirements. As a result of this review, one violation was identified (see paragraph A of Inspection Results).

3. Assembly and Test - The NRC inspector reviewed ASCO's Quality Control Manual Section 11, "Quality Control of Test." The NRC inspector witnessed the final testing of three valves. Also examined were five SO's, test procedures, six inspection data sheets, test logs, associated equipment calibration records, and QC audit records. The NRC inspector reviewed the vendor's control system for inspection stamps and signatures. During the course of review of final test records and a previously identified unresolved item (Report No. 79-01), it was noted that the inspector was not stamping or signing off the back of the SO. One nonconformance was identified as a result of this review of documentation (see paragraph B.2 of Inspection Results).

ORGANIZATION: BABCOCK & WILCOX COMPANY
NUCLEAR POWER GENERATION DIVISION
LYNCHBURG, VIRGINIA

REPORT NO.: 99900400/82-03	INSPECTION DATE(S) 8/17-18/82	INSPECTION ON-SITE HOURS: 15

CORRESPONDENCE ADDRESS: The Babcock & Wilcox Company
Nuclear Power Generation Division
ATTN: Mr. D. E. Guilbert, Vice Pres. & Gen. Mgr.
P. O. Box 1260
Lynchburg, VA 24505

ORGANIZATIONAL CONTACT: Mr. D. V. Ferree, QA Manager
TELEPHONE NUMBER: (804) 385-3335

PRINCIPAL PRODUCT: Nuclear steam supply system and fuels, engineering services, and operating plant support.
NUCLEAR INDUSTRY ACTIVITY: The total effort committed to domestic nuclear activities is approximately 90% of the 1,600 employees of the Nuclear Power Generating Division. Principal activities include the design and procurement of nine projects; Bellefonte, Midland, Washington Public Power Supply System, North Anna, and Pebble Springs; and providing engineering services under 129 service contracts and 38 fuel reload contracts.

ASSIGNED INSPECTOR: C J Hale 9/27/82
C. J. Hale, Reactor Systems Section (RSS) Date

OTHER INSPECTOR(S):

APPROVED BY: C J Hale 9/27/82
C. J. Hale, Chief, RSS Date

INSPECTION BASES AND SCOPE:

A. BASES: Babcock & Wilcox (B&W) Topical Report, BAW-10096A.

B. SCOPE: This inspection was in response to a request from the NRC's Division of Systems Integration to inspect the development, verification, and use of computer codes POWER TRAIN, CADDS, and TRAP 2.

PLANT SITE APPLICABILITY:

None Identified.

ORGANIZATION: BABCOCK & WILCOX COMPANY
NUCLEAR POWER GENERATION DIVISION
LYNCHBURG, VIRGINIA

REPORT NO.: 99900400/82-03	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATIONS:

None

B. NONCONFORMANCES:

Contrary to Section 5 of topical report BAW-10096A and procedure NPG-0903-13, an error identified in the hybrid computer program POWER TRAIN was not processed in accordance with the instructions of Exhibit C of NPG-0903-13.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

This area was not inspected during this inspection. The following is a listing of those previous findings that currently are considered open.

1. (Open) Unresolved Item (82-01): Certain structural analyses may not meet regulatory requirements in that they do not appear to be sufficiently detailed with respect to assumptions, bases, source of inputs, reference to the hardware design drawings, analytical model-to-hardware relationship, and interpretation of results.

2. (Open) Unresolved Item (82-01): Procurement controls for flow control valves do not appear to comply with QA program commitments, in that valves were furnished that were not designed to provide the required minimum flow of two gallons per minute in the closed position at a pressure differential of 820 pounds per square inch, and which B&W-NPGD source surveillance and vendor drawing review failed to detect.

3. (Open) Nonconformance (82-02): The Historical Document List (HDL) did not serve as an index to safety-related Procurement Authorization (PA) records in the Records Center as evidenced by the fact that PA's 83-768661-00 through 83-768661-09, related to the design and procurement of MK-B5 fuel assemblies and axial blanket fuel assemblies for the SMUD Rancho Seco Cycle 6 fuel reload, were not identified on the HDL.

4. (Open) Nonconformance (82-02): The first page of calculations 32-1119748-00 and 32-1122317-00, did not have a completely filled out CDS form. The section of the form titled "Summary of Result" did not contain a summary of the results of the calculation.

ORGANIZATION: BABCOCK & WILCOX COMPANY
NUCLEAR POWER GENERATION DIVISION
LYNCHBURG, VIRGINIA

REPORT NO.: 99900400/82-03	INSPECTION RESULTS:	PAGE 3 of 4

5. (Open) Nonconformance (82-02): PUL's were not used to indicate needed changes/additions known at the time of release or to indicate input requirements unavailable at the time of release, for safety-related calculation summary; e.g., 86-1123144-00. These documents were various types of calculation summaries (e.g., 32-1122317-00), which were known at the time to have a PUL relating to the need for verification of source data/references outstanding against it. Further, these design documents were reviewed, released, and transmitted to users without any indication that changes may be required as a result of clearing PUL's that were outstanding.

6. (Open) Nonconformance (82-02): Certain PUL's issued from January 1981 to March 1981 were not: (1) listed on the HDL against the affected calculation; (2) distributed by Release Administration; or (3) associated with the document to be revised and retained in the Records Center.

E. OTHER FINDINGS OR COMMENTS:

1. Background

The Reactor Systems Branch (RSB) of the NRC's Division of Systems Integration requested the Vendor Program Branch of Region IV to conduct an inspection of the development, verification, and use of the POWER TRAIN, CADDS, and TRAP-2 computer codes. These codes are being reviewed currently by the RSB and a Safety Evaluation Report is being prepared.

2. Findings

The applicable procedures in B&W's Administrative Manual were reviewed. Records reviewed to verify implementation included computer program manuals, certification files, and certification test case files for the POWER TRAIN and CADDS programs.

TRAP-2 records were not reviewed during this inspection; however, this program's records were inspected during the 99900400/78-03 inspection which resulted in several modifications to B&W's procedures controlling computer program's development, verification, and use.

Both POWER TRAIN and CADDS are high use codes. CADDS 27.0 received Full Certification on March 31, 1982, and has been accessed for use 310 times since. POWER TRAIN V 1.0 received Full Certification on March 30, 1982, and since April 1, 1982, has accounted for almost all the activity in the Hybrid Computer Lab. POWER TRAIN is a hybrid computer code, utilizing both digital and analog computers, and is only executed in the Hybrid Computer Lab.

ORGANIZATION: BABCOCK & WILCOX COMPANY
NUCLEAR POWER GENERATION DIVISION
LYNCHBURG, VIRGINIA

REPORT NO.: 99900400/82-03	INSPECTION RESULTS:	PAGE 4 of 4

On or about June 21, 1982, an error was identified in POWER TRAIN V 1.0. The error dealt with the calculation of the time derivatives of fuel and clad temperatures. B&W's analysis of the effects of this error was shown to have little effect on steady-state behavior; however, the error did predict that the fuel and clad temperatures would fall more rapidly during certain transients. B&W concluded that the consequences of the error were not safety significant and have already revised the program (POWER TRAIN V 2.0) and as soon as benchmark comparison runs are completed, the corrected version will be ready for Full Certification. A nonconformance (B. above) was identified in this area in that B&W personnel did not follow their established procedure for processing this code error.

The following items will be inspected further during subsequent inspections.

a. The distribution and control of computer program manuals are specified in existing procedures; however, the procedures reviewed do not specify actions to be taken when receipt acknowledgements are not returned or what retention requirements apply to these records.

b. The independent reviewer of CADDS 27.0 was the supervisor of the responsible engineer that developed the version. B&W procedures preclude only the responsible engineer's manager from this activity. The independence and effectiveness of using the supervisor in this capacity will be considered further.

ORGANIZATION: THE BAHNSON COMPANY
WINSTON-SALEM, NORTH CAROLINA

REPORT NO.: 99900791/82-01	INSPECTION DATE(S): 9/7-10/82	INSPECTION ON-SITE HOURS: 46

CORRESPONDENCE ADDRESS: The Bahnson Company
ATTN: Mr. John D. Canup
Quality Assurance Manager
P. O. Box 10458
Winston-Salem, North Carolina 27108

ORGANIZATIONAL CONTACT: Mr. J. D. Canup, Quality Assurance Manager
TELEPHONE NUMBER: (919) 724-1581

PRINCIPAL PRODUCT: Heating, Ventilation, and Air Conditioning (HVAC) Components.

NUCLEAR INDUSTRY ACTIVITY: Commercial Nuclear production of the Bahnson Company totals 10% of the company production.

ASSIGNED INSPECTOR: J. W. Sutton — 11/8/82
J. W. Sutton, Reactive and Component Program Section (R&CPS) — Date

OTHER INSPECTORS: D. Norman, R&CPS

APPROVED BY: I. Barnes — 11/8/82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and 10 CFR Part 21.

B. SCOPE: This inspection was made as a result of the receipt of allegations by the Nuclear Regulatory Commission (NRC) pertaining to implementation of the Bahnson Company quality assurance program and was performed in conjunction with an investigation by the Atlanta Field Office of the NRC Office of Investigation. Programmatic areas pertinent to the allegations were reviewed during this inspection.
(cont. on next page)

PLANT SITE APPLICABILITY: Docket Nos. 50-395, 50-528.

ORGANIZATION: THE BAHNSON COMPANY
WINSTON-SALEM, NORTH CAROLINA

REPORT NO.: 99900791/82-01	INSPECTION RESULTS:	PAGE 2 of 5

SCOPE: (cont.) Investigative findings with respect to the specific allegations are contained in NRC Report No. 4-82-015. In addition, the inspection addressed the identification by South Carolina Electric and Gas Company that certain setscrews contained in the linkage for ventilation system dampers could vibrate loose. In order to assess the identified problems, the following areas were inspected: QA organization; Part 21 inspection; nonconformance and corrective action; special process control (welding); inspection, test, and operating status; and control of instructions, procedures, and drawings.

A. VIOLATIONS:

Contrary to Section 21.21 of 10 CFR Part 21, procedures for evaluating deviations had not been generated by the vendor.

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50, AWS D1.1, paragraph 6.7.7, and QA Manual Procedure IX, paragraph D.4, an individual qualified to Magnetic Particle Level I was performing magnetic particle inspections of welds with no supervision from a Level II inspector.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and QA Manual Procedure XIV, paragraphs D1 and D2, the Quality Assurance program does not provide the control necessary to assure proper processing, inspection, and test of items during manufacturing, as evidenced by:

   a. The Unit Inspection Sheet does not provide a means to track all operations and inspections required to be performed.

   b. There is no provision for documenting rejection of work which fails to comply with requirements.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50, AWS D1.1 paragraph 2.1.1, and CTI Drawings Nos. 32881 and 32882, the HVAC Unit top and side housing were joined with a square groove butt joint welded on both sides of the joint. The drawings call for a square groove butt joint welded from one side with full penetration and melt-thru to the other side. Documentation was not made available which would permit deviation from drawing requirements.

ORGANIZATION: THE BAHNSON COMPANY
WINSTON-SALEM, NORTH CAROLINA

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C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Followup on a Regional Request - South Carolina Electric and Gas Company (SCE&G) VC Summer Nuclear Station No. 1 reported a problem that certain setscrews contained in the linkages for ventilation system dampers could vibrate loose.

   SCE&G notified the NRC:RII on December 18, 1979, and February 8, 1980, in 10 CFR Part 50.55(e) reports, regarding loosening of setscrews in ventilation heavy duty dampers as a result of vibration under operating conditions. The NRC inspector reviewed correspondence and documentation between the Bahnson Company and SCE&G pertaining to this problem. The vendor previously did not fabricate dampers. Dampers normally were purchased from outside vendors for installation in Bahnson's ventilation systems. The heavy duty dampers purchased by SCE&G were designed by Bahnson for the Summer Unit only and were one of a kind. Therefore, this is not considered to be a generic problem. The correspondence review indicated that the corrective action taken at the site was determined to be acceptable. This action consisted of tack welding the collar of the limit switch arm to the damper shaft to prevent the setscrews from coming loose. Drawings of the installations have been modified to show the corrective action that has been taken and would be taken to prevent this problem from recurring in future manufacture of this type of dampers. All repair work to these dampers has been completed by the Bahnson Company field repair representatives.

2. 10 CFR Part 21 Inspection - The NRC inspector reviewed available documentation pertaining to the vendor's policy that would be used for the evaluation of identified component defects which could be reportable under 10 CFR Part 21 requirements. Posting was checked with respect to 10 CFR Part 21 requirements and found to be in compliance with the regulation. The NRC inspector requested to review Bahnson's procedure

ORGANIZATION: THE BAHNSON COMPANY
WINSTON-SALEM, NORTH CAROLINA

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for evaluation and reporting of defects under the requirements of 10 CFR Part 21. Bahnson's QA personnel indicated that Quality Operating Procedure XV-001, paragraph 6.3, would cover this item. A review of this paragraph indicated, however, that it did not provide appropriate guidance for evaluation and reporting of defects. As a result of this review, one violation was identified (see Section A of Inspection Results).

3. Quality Assurance Organization - The NRC inspector reviewed the current QA Manual for organization and program commitments, Sections I and II. Quality Operating Procedure II-001 and organizational charts were reviewed for compliance with 10 CFR Part 50, Appendix B requirements. The NRC inspector was informed that a major reorganization has taken place and jobs and job descriptions, as indicated in the QA Manual, would be revised. The changes to the manual will be reviewed during a subsequent inspection.

4. Nonconformance and Corrective action - The NRC inspector reviewed Bahnson's Quality Assurance Manual Sections XV and XVI and Quality Operating Procedures XV-001 and XVI-001 for content. The NRC inspector also reviewed 20 deficiency, disposition, and supplier nonconformance reports, and associated documentation. Segregation areas designated for storage of nonconforming items were inspected. The corrective actions taken to prevent recurrence were reviewed for implementation.

5. Inspection, Test, and Operating Status - Quality Manual Procedures and Instructions, Section XIV, the shop travelers, and NDE records for two completed HVAC units were reviewed. It was noted that data for completing NDE records are being taken from the Unit Inspection Sheet which accompanies items through the manufacturing process. The documents reviewed indicated that controls were not available to assure that all required inspections and tests were being performed. Work which has been rejected by the inspector also could not be determined, even though rejections are shown on the NDE test record. Information shown on the NDE test reports is not directly traceable to the Unit Inspection Sheet from which data was taken. One nonconformance was identified (see Section B.2 of the Inspection Results).

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REPORT NO.: 99900791/82-01	INSPECTION RESULTS:	PAGE 5 of 5

6. Special Process Control (Welding) - The inspector reviewed Bahnson's Quality Assurance Manual Section IX, CTI Specification CES-243, two welding procedures, six NDE test reports, and three NDE technician qualification certificates to determine compliance with requirements and procedures.

   One nonconformance was identified as a result of this review (see Section B.1 of Inspection Results).

7. Control of Instructions, Procedures, and Drawings - The Quality Assurance Manual, Section V, Procedure V-001, and four drawings were reviewed to determine if technical requirements were being properly translated into working level procedures. A review of shop activities primarily in the welding area was also conducted to determine if floor level procedures were available and being followed. One nonconformance was identified (see Section B.3 of Inspection Results).

ORGANIZATION: BECHTEL POWER CORPORATION
GAITHERSBURG POWER DIVISION
GAITHERSBURG, MARYLAND

REPORT NO.: 99900519/82-03	INSPECTION DATE(S) 10/4-8/82	INSPECTION ON-SITE HOURS: 32

CORRESPONDENCE ADDRESS: Bechtel Power Corporation
Gaithersburg Power Division
ATTN: Mr. J. M. Komes, Vice Pres. & General Manager
15740 Shady Grove Road
Gaithersburg, MD 20877

ORGANIZATIONAL CONTACT: Mr. D. C. Kansal, QA Manager
TELEPHONE NUMBER: (301) 258-3776

PRINCIPAL PRODUCT: Architect Engineering Services

NUCLEAR INDUSTRY ACTIVITY: The Gaithersburg Power Division has a total of 2848 employees of which 1834 are assigned to nuclear projects. Major projects include Callaway, Unit 1; Wolf Creek, Unit 1; and Grand Gulf, Units 1 and 2. There are also modification/repair/service contracts on 16 additional reactor units.

ASSIGNED INSPECTOR: J. R. Costello — 11/24/82
J. R. Costello, Reactor Systems Section (RSS) — Date

OTHER INSPECTOR(S):

APPROVED BY: C. J. Hale — 11/30/82
C. J. Hale, Chief, RSS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B; SNUPPS PSAR, Chapter 17; and Grand Gulf PSAR, Chapter 17.

B. SCOPE: Inspection of Bechtel's QA program on audits and four 10 CFR Part 50.55(e)/10 CFR Part 21 reports from Grand Gulf which covered the following: (1) failure of Hiller actuators upon gradual loss of air pressure; (2) corroded terminal boards in Rosemount transmitters; (3) incorrect
(Cont. on next page)

PLANT SITE APPLICABILITY:

The contents of this report relate to the following dockets: 50-416, 50-417, 50-482, and 50-483.

ORGANIZATION: BECHTEL POWER CORPORATION
GAITHERSBURG POWER DIVISION
GAITHERSBURG, MARYLAND

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SCOPE: (Cont.) installation of "O" rings on Rosemount transmitters; and (4) jet impingement loads erroneously reduced due to a wrong interpretation of the Moody jet impingement analysis.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Nonconformance (82-02): Several individual signature identification cards were not completed in accordance with procedures.

   A review of all signature cards in the central file has been completed. An additional 34 cards were found incorrectly filled out. All signature cards are now correct. To prevent recurrence of this problem, EDP-7.5 has been revised removing the longhand requirement on signature cards and stressing the importance of traceability and reproducibility. Direct responsibility has been placed on the Supervisor of Personnel Records and Supervisor of Administration and Records Management for issuing and checking the signature cards.

2. (Closed) Nonconformance (82-02): Outstanding design change notices (DCN) are not being incorporated into drawings within the required time frame.

   All DCN's outstanding beyond the required time limit have been incorporated into applicable drawings. To prevent recurrence of this problem, quality engineering will continue to notify the project monthly of outstanding DCN's needing incorporation into drawings. EDPI-4.46-01 and PEPM 4.3.1.6 have been revised to remove the conflict with EDPI-4.47-01. Each discipline has established a log to track open DCN's

and is issuing to responsible personnel a monthly "tickler list" identifying those DCN's to be incorporated into drawings within the next calendar month. All responsible personnel have been alerted in meetings regarding this requirement.

3. (Open) Nonconformance (82-02): Some Grand Gulf specifications did not identify the applicable dates, revisions, or addenda of technical codes and standards.

   Remedial action will not be completed until November 15, 1982.

E. OTHER FINDINGS OR COMMENTS:

1. Audits - Chapter 17 of the SNUPPS PSAR, applicable SNUPPS quality assurance procedures and QA department procedures were examined to determine quality assurance program commitments. To verify implementation of these commitments, the following documents were examined: two project QA master audit plans, two QA management audit schedules, three supplier audits, three purchasing audits, one technical audit, one management audit, and three engineering audits. Relative to the documents examined, all procedural commitments were being properly implemented.

2. Design Interfaces/Design Document Control Followup from 82-02 Inspection

   a. A review of Grand Gulf specifications showed that specification change notices (SCN) 7, 8, and 9 had not been incorporated into Specification 9645-C-103.1 within 90 days as required by PEPM 4.5.1.6.2. This appeared to be an isolated case.

      SCN's 7, 8, and 9 were incorporated into Specification 9645-C-103.1 in Revision 9, dated June 8, 1982. A further review of Grand Gulf specifications indicates this was an isolated case. No further examples were noted.

   b. Section 4.2 of EDP-1.10 has a requirement which states, "In cases where an EDPI exhibit is modified, but the basic EDPI remains unchanged, the revised exhibit may be issued separately. In such cases, the revision date is added as the fourth line in the identification block." In reviewing EDPI-5.25-01, Revision 2, where

the exhibits had been revised, it was noted that the revision date was added, but was not added as the fourth line in the identification block.

This was corrected by revising EDPI-5.25-01, which made the exhibits the same issue as the EDPI and which removed the requirement for putting the date on the fourth line for any future revisions of exhibits.

c. Section 4.0 of EDPI-5.25-01 states in part, "Revisions to the Project Master Distribution Schedule shall be as defined in Section 3.0." The inspector was unable to identify in Section 3.0 how revisions to the Project Master Distribution Schedule would be made.

EDPI-5.25-01 was revised removing references that were not needed and were confusing.

d. Section 6.0 of EDPI-4.49-01 states, "A coordination signature block shall be provided for each Bechtel specification for required discipline Group Supervisor/Group Leader or an assigned subordinate's initials." A review of SNUPPS specifications disclosed that the coordination signature blocks were missing on Specifications J-601(Q), M-140(Q), and M-00BL(Q).

The requirement for the coordination signature block was incorporated into EDPI-4.49-01 in a revision dated May 19, 1980. One of the specifications listed above still had a revision date prior to May 19, 1980, and did not need to be revised, but 11 specifications required the coordination signature blocks to be added.

No nonconformances resulted from this followup of open items from the 82-02 inspection.

3. Failure of Hiller Actuators - During preoperational testing (Grand Gulf, Unit 1) designed to simulate a gradual loss of air in accordance with position C.9 of Regulatory Guide 1.80, a large number of pneumatically operated isolation valves in the instrument air system failed to go to their fail-safe condition. This item was reported to NRC Region II by Mississippi Power and Light (MP&L).

The problem was corrected by adding safety-related pressure switches to the system to sense air supply pressure to the valve.

To prevent recurrence of the problem, the Bechtel specification for valve air operators was revised on August 9, 1982, to include the following additional requirement: "Designs which use stored air in lieu of a spring to affect fail-safe positioning of the valve shall consider the effects of loss of air from the solenoid or the air supply line. The loss of air shall be assumed to occur at varying decay reates, i.e., slow decay in addition to instantaneous loss."

Bechtel considered the problem to be generic and issued a Quality Assurance Information Flyer QAIF G-82-06 covering the Hiller/Shaffer actuator failure. NRC Headquarters issued IE Information Notice No. 82-25, "Failure of Hiller Actuators Upon Gradual Loss of Air Pressure," on July 20, 1982.

The original Bechtel specification for valve air operators was issued in August 1973. Regulatory Guide 1.80 was issued in June 1974 and was replaced by Regulatory Guide 1.68.3 in April 1982. Documented evidence shows that neither of the above regulatory guides were included in contractual requirements issued to the Hiller Company in 1975.

No documented evidence was examined to show that Regulatory Guide 1.80 or Regulatory Guide 1.68.3 had been imposed on Bechtel by MP&L at the time of procurement. This item will remain open for further documentation review to determine if this test requirement to simulate a gradual loss of air was imposed on Bechtel for other projects, and if Bechtel's reaction to this change in regulatory position was processed in a timely manner.

4. Corroded Terminal Boards In Rosemount Transmitters - MP&L (Grand Gulf, Unit 1) reported to Region II that the terminal board areas of 29 pressure transmitters, level transmitters, and flow transmitters located inside the containment were found to be corroded. The terminal boards are located in a cavity underneath a threaded cap which is sealed to the transmitter unit by thread contact and an "O" ring. Each terminal board cavity communicates with a junction box through a sealed conduit. Each juntion box is also sealed.

The transmitters were installed in accordance with Bechtel drawing E-0730, "Class 1E Equipment Environmental Sealing," which is very specific. The problem is being investigated at the site by MP&L and there was no documented evidence at Bechtel-Gaithersburg of what caused the problem.

Several transmitters, in addition to the ones with corroded terminal boards, have been found containing water. The cause of the corrosion is believed to be water entering the transmitters and then electrolysis occurring.

Since the specific cause of the corrosion has not been determined, definitive actions to prevent recurrence cannot be formulated at this time. To prevent water from entering the transmitters, the required seals will be maintained so that moisture will not be allowed to enter the terminal board cavities.

The affected transmitters have been restored to their original design criteria and present plans call for reinspection prior to low power ascension testing. However, this is only a temporary fix and this item will remain open until the cause and a proper fix are determined.

5. Incorrect Installation of "O" rings on Rosemount Transmitters - MP&L (Grand Gulf, Unit 1) reported to Region II that the installation of the "O" ring seals on Rosemount transmitters did not conform to requirements of NUREG 0588, Class 1E, for components located inside containment. The "O" ring was extruded when the cover was tightened on the transmitter.

The deficiency occurred when a lubricant (Fel Pro-N-1000), which has a hydrocarbon carrier, was applied to the transmitter to prevent galling of the mating threads on the transmitter housing and housing covers. The hydrocarbon carrier caused the ethylene propylene rubber "O" ring seals to deteriorate, which permitted the "O" rings to extrude from the sealing surface when the covers were hand tightened.

The instruction manuals for the Rosemount transmitters contain precautionary paragraphs requiring the use of silicone oil on the "O" ring. To correct this problem, Bechtel will take all of the effected transmitters and have the threads on the housings and covers cleaned, inspected, and relubricated with Neolube or other vendor-approved lubricant. The "O" rings will be replaced after being lightly coated with Dow-Corning 55 silicone grease (a nonhydrocarbon based lubricant). Controls will be put in place to prevent recurrence of this deficiency.

This does not appear to be a generic problem, but rather an error committed by the site construction personnel regarding the use of lubricants with hydrocarbons around Rosemount "O" rings. Bechtel has notified other projects and divisions of this potential problem by issuance of a Management Corrective Action Report.

No nonconformances or unresolved items were identified in this area of inspection.

6. Jet Impingement Load Errors - MP&L (Grand Gulf, Unit 1) reported to Region II that the jet impingement pressure used in calculating impingement loads on targets was erroneously reduced by 14.7 psi. The problem was discovered by Bechtel during the preparation of the final pipe break report by project engineering.

The problem involved the use of incorrect jet impingement loads in evaluating the ability of essential components to withstand the effects of postulated high energy line breaks. The following two errors were made:

a. 14.7 psi was subtracted from the calculated jet impingement pressure at the target to correct for the atmospheric pressure acting on the other side of the target. It has now been determined that atmospheric pressure can be subtracted from source pressure only.

b. Thrust coefficient factors used in the Moody expansion of jets were reduced by using a correction factor to account for the effect of increasing friction. This step was incorrect, since it failed to account for the effects of decreasing expansion angle associated with increasing friction. The decrease in expansion angle causes "focusing" of the jet, which yields higher target pressures.

These errors reduced the calculated jet impingement load on the targets, thereby causing the analysis to be nonconservative.

To correct the deficiency, Technical Specification 9645-M-195.0, used by Bechtel personnel to calculate jet impingement loads, was revised and all jet impingement loads were recalculated. Essential targets were reevaluated and analyzed where required. Those essential targets unable to withstand the impingement load were modified or shielded. The

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GAITHERSBURG POWER DIVISION
GAITHERSBURG, MARYLAND

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original Bechtel design specification was not specific enough regarding how to use Moody jet impingement analysis and required the addition of new examples.

To prevent future occurrences on the Grand Gulf Project, the Technical Specification 9645-M-195.0 was revised and reissued (Revision 5). Other Bechtel projects were notified of the problem by issuance of Problem Alert No. N-82-1.

This problem was due to an error in interpretation of a technical specification and has generic aspects. It has been reported as a 10 CFR Part 21 deficiency by Bechtel.

No nonconformances or unresolved items were identified in this area of inspection.

ORGANIZATION: BECHTEL POWER CORPRATION
LOS ANGELES POWER DIVISION
NORWALK, CALIFORNIA

REPORT NO.: 99900521/82-04	INSPECTION DATE(S) 8/30-9/3/82	INSPECTION ON-SITE HOURS: 31

CORRESPONDENCE ADDRESS: Bechtel Power Corporation
Los Angeles Power Division
ATTN: Mr. L. G. Hinkelman, V. President and Gen. Mgr.
P. O. Box 60680, Terminal Annex
Los Angeles, CA 90060

ORGANIZATIONAL CONTACT: Mr. R. L. Patterson, QA Manager
TELEPHONE NUMBER: (213) 864-6011 ext. 2061

PRINCIPAL PRODUCT: Architect Engineering Services

NUCLEAR INDUSTRY ACTIVITY: The Los Angeles Power Division of the Bechtel Power Corporation is the architect engineer for nine domestic reactor units. Fifty percent of the total personnel (approximately 6,700) are assigned to activities in connection with these units and two modification/repair/service type contracts.

ASSIGNED INSPECTOR: J. R. Costello — 10/19/82
J. R. Costello, Reactor Systems Section (RSS) — Date

OTHER INSPECTOR(S): W. B. Swan, Region II

APPROVED BY: C. J. Hale — 10/22/82
C. J. Hale, Chief, RSS — Date

INSPECTION BASES AND SCOPE:

A. BASES 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was conducted to review the present practices being used to process field change notices on the Alvin W. Vogtle Nuclear Project, to assess the effectiveness of Bechtel's QA program in the area of design document control, and the status of previous inspection findings.

PLANT SITE APPLICABILITY: The contents of this report relate to the following dockets: 50-424, 50-425, 50-528, 50-529, and 50-530.

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LOS ANGELES POWER DIVISION
NORWALK, CALIFORNIA

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A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Nonconformance (82-01): No managers or their designees attended the preaudit and postaudit conferences for a management audit of the SONGS 2 and 3 engineering office. Also, no department/project/construction manager or their designees attended the preaudit conference for the management audit of the Vogtle design office.

   Project managers have been requested to assure that a responsible project individual is assigned as a designee when they are not available. Also, QA Supervisors and Audit Team Leaders have been reinstructed to assure that a responsible project individual is in attendance during preaudit and postaudit conferences.

2. (Closed) Nonconformance (82-01): The response to CAR-002 from the management audit of the Vogtle design office was 11 days beyond the 30-day requirement and no schedule date for response had been established. Further, the management audit of division engineering had scheduled corrective action for CAR-001 by March 20, 1981, and the item was still open a year later.

   A response date extension for CAR-002 was granted verbally by the Management Audit Team Leader, but was not documented on the CAR tracking log. Management Audit Team Leaders have been instructed to document any revised due dates on the CAR tracking log.

   CAR-001 was resolved by issuance of Engineering Department Procedure 4.57, Technical Service Contracts, dated May 11, 1982. This procedure defines quality requirements for Technical Service Contracts.

3. (Closed) Nonconformance (82-01): The Vogtle Audit Activity Report for January and February 1982 did not identify the personnel contacted during the preaudit, audit, and postaudit activities.

   The Vogtle Audit Activity Reports for January and February 1982 were corrected to reflect personnel contacted during the preaudit and postaudit activities. A review of other audit reports was conducted and no further nonconformances were identified.

   QA Supervisors and Audit Team Leaders have been reinstructed to assure that audit activity reports reflect personnel contacted during preaudit, audit, and postaudit activities.

4. (Closed) Nonconformance (82-02): Five out of six Deficiency Evaluation Reports (DER) examined did not comply with the procedural requirement of EDP 4.66 that the initiator sign and date the DER's.

   EDP 4.66 is an engineering department procedure which provides instructions to engineering personnel on how to fill out a DER which is basically a QA department form. The DER form does not require a date in the block reserved for the report initiator, but does require a signature. The date is provided elsewhere on the form.

   Project QA Engineers have been instructed to verify that all DER's have the initiator's signature prior to validation. In addition, the Division QA staff will review DER's to assure the initiator's signature is present.

   Bechtel did not attempt to retrofit the initiator's signature on DER's previously issued as all DER's had been reviewed, signed, and dated by the Project QA Engineer. They believe the Project QA Engineer's signature attests to the DER's authenticity.

5. (Closed) Unresolved Item (82-02): Procedure IP-2.12 (Palo Verde Project) has a requirement which states, "If the response to an audit report or corrective action request cannot be made by the requested due date, the Project Quality Engineer (PQE) or responsible Group Supervisor (GS) shall prepare a handwritten memo requesting an extension of time. The memo shall state the reason why the audit report cannot be answered by the requested due date

and shall be countersigned by the Project Engineer (PE)." The inspector reviewed six corrective action reports (CAR), two of which requested an extension of time, but were not signed by the PE. It could not be determined during the inspection whether these should have been signed by the PE, or whether they were special cases not requiring the PE signature.

The two CAR's PVH 81/285 and PVH 82/073 were special cases which did not require a PE signature and did not deviate from IP-2.12 requirements. One pertained to an extension of time for corrective action implementation and the other was assigned to procurement for response which is not covered by IP-2.12

E. OTHER FINDINGS OR COMMENTS:

1. Vogtle Field Change Notice Controls - This was a joint inspection with a representative from Region II. Section 17, Part C, Revision 4 (August 13, 1982) of VNP Project Reference Manual, "Vogtle Field Change Notice Log," and rejected Field Change Notices were reviewed for requirements and implementation of requirements.

   From October 1981, the start of the field change notice (FCN) program, until September 1982, 140 FCN's have been processed versus 4840 field change requests (FCR). This represents 2.89% of the FCR's. Of the 140 FCN's processed, 13 were rejected for a percentage rejection of 9.29%. Reviewing the 13 rejections, it was found that 10 were converted to nonconformance reports, 2 were converted to FCR's, and 1 was dropped as not necessary.

   At the present time there is no loop-closing method for rejected FCN's. The information is available in the system, but is not being returned to the engineers who made the original decision to reject the FCN. At the present time, Bechtel project personnel (Vogtle project) are working with Georgia Power Company on procedural changes to notify Bechtel engineering regarding what happens to rejected FCN's.

   The FCN control program requires a 5-day turnaround time with 2 days allotted to Bechtel to process an FCN. At the present time, these time constraints are being met.

The inspectors found the present FCN control program operating satisfactorily. As construction progresses and the installation of pipe hangers increases, this picture could change. This program will be further reviewed during future inspections.

2. Design Document Control - Chapter 17 of the Alvin W. Vogtle PSAR, applicable quality assurance program procedures, and Vogtle project procedures were examined to determine quality assurance program commitments. The following documents were examined: five calculations, five specifications, nine drawings, three CEPUS control logs, and one document entitled "Westinghouse Plant and Equipment Parameters." Relative to the documents examined, the following concern was identified.

ANSI N45.2.11 (Quality Assurance Requirements for the Design of Nuclear Power Plants) states in part, "Systematic methods shall be established for communicating needed design information across external design interfaces, including changes to the design information as work progresses." Also, Section 17A of the Vogtle PSAR states in part, "The design control program incorporates measures for identification and control . . . of such external interfaces as nuclear steam system supplier . . . these measures include . . . definition of interfaces and control of communication with organizations external to Bechtel Power Corporation (BPC)."

On the Vogtle project, the responsibility for determining which Westinghouse documents are interface documents is the responsibility of the Nuclear Engineering Group Leader. The determination of which Bechtel documents are interface documents are determined by the Bechtel engineering disciplines. Requests for calculations can be made by Westinghouse or Bechtel and this interface will be handled by correspondence. Nowhere is there a complete list of all the AE/NSSS interface documents.

The inspector is concerned that there is not adequate design change accountability for all interfacing documents and that there is not adequate assurance that all interfacing documents have been thoroughly reviewed and concurred in by both parties. This concern will be further reviewed in a future inspection.

No nonconformances or unresolved items were identified in this area of inspection.

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LOS ANGELES POWER DIVISION
NORWALK, CALIFORNIA

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3. Signature and Initial Identification Followup - In the 82-02 inspection, it was found that the practice of maintaining documentation of signatures and initials of design reviewers was not adequately controlled on the Vogtle and Palo Verde projects.

A review of the Vogtle project showed that they have issued Section 7, Part B, VNP Project Reference Manual, Revision 0, dated August 26, 1982, entitled "Document Signature and Initial Identification." This document requires the project administrator to update the signature list monthly. The inspector reviewed the latest signature list and found it satisfactory.

A review of the Palo Verde project showed that all design reviewers' signatures or initials have been obtained or have been explained satisfactorily. Also, Procedure IP-2.8 is being revised for definition of responsibilities for project signature list review signoff. The new revision is scheduled to be issued September 6, 1982.

ORGANIZATION: BECHTEL POWER CORPORATION
SAN FRANCISCO POWER DIVISION
SAN FRANCISCO, CALIFORNIA

REPORT NO.: 99900522/82-02	INSPECTION DATE(S) 7/12-15/82	INSPECTION ON-SITE HOURS: 51

CORRESPONDENCE ADDRESS: Bechtel Power Corporation
San Francisco Power Division
ATTN: Mr. C. D. Statton, Vice Pres. and Gen. Mgr.
P. O. Box 3965
San Francisco, CA 94119

ORGANIZATIONAL CONTACT: Mr. E. R. Nelson, Manager of Division QA
TELEPHONE NUMBER: (415) 768-0777

PRINCIPAL PRODUCT: Architect Engineering Services

NUCLEAR INDUSTRY ACTIVITY: The total effort committed to domestic nuclear activities is approximately 92% of the 7000 person staff of the San Francisco Power Division. The division currently provides the principal architect engineering services for four domestic units: Limerick 1 and 2, Susquehanna 2, and Hope Creek 1; has project management for completion of Diablo Canyon 1 and 2; has 12 units under a modification/repair/service-type contract; and an engineering evaluation contract with an NSSS supplier.

ASSIGNED INSPECTOR: J. R. Costello
J. R. Costello, Reactor Systems Section (RSS) Date 9/8/82

OTHER INSPECTOR(S): Dr. P. T. Kuo, NRC Division of Engineering

APPROVED BY: C. J. Hale
C. J. Hale, Chief, RSS Date 9/8/82

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made as a result of concerns expressed to the NRC by a former Bechtel employee regarding the use of a 2D analytical procedure for the hydrodynamic load analysis of the Susquehanna and Limerick facilities.

PLANT SITE APPLICABILITY: The contents of this report relate to the following dockets: 50-352; 50-353; 50-387; 50-388; and 50-354.

ORGANIZATION: BECHTEL POWER CORPORATION
SAN FRANCISCO POWER DIVISION
SAN FRANCISCO, CALIFORNIA

REPORT NO.: 99900522/82-02	INSPECTION RESULTS:	PAGE 2 of 5

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Unresolved Item (82-01): It is not apparent that the requirements of EDPI-4.64.1 for reviewing and dispositioning quality surveillance reports are functioning properly. Hope Creek Quality Surveillance Report No. 96 required procurement supplier quality action by July 10, 1981. The inspector was unable to obtain any evidence during this inspection that the required action had been completed.

   It was determined that Quality Surveillance Report No. 96 pertained to hardware for Hope Creek Unit 2 which has been put on hold. No further action will be taken unless Unit 2 is reactivated.

2. (Closed) Unresolved Item (82-01): It is not apparent that the requirements for specificity concerning codes and standards contained in EDP-4.49 are being satisfied. EDP-4.49 required that applicable codes, standards and regulatory requirements have the issue and addenda properly identified and that these requirements be met in the design.

   The inspector examined four Hope Creek project specifications and found that specification 10855-A-075(Q) did not specify the issue and addenda of four out of five codes and standards listed, while specification 10855-J-111(Q) did not specify the issue of ANSI N45.2 in effect.

   Specification 10855-A-075(Q), Revision 3, is in the process of being revised for other reasons and will include correction of these discrepancies. Specification 10855-J-111(Q), Revision 0, Section 11.0, references G-002(Q), General Project Requirements for Supplier Programs. Section 2, of G-002, references ANSI N45.2-1971 issue. Therefore, the QA requirements were not compromised. Specification J-111(Q) has been marked up to correct the noted discrepancy on the next revision.

ORGANIZATION: BECHTEL POWER CORPORATION
SAN FRANCISCO POWER DIVISION
SAN FRANCISCO, CALIFORNIA

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Also, Manager of Engineering Directive MED 4.49-0 has been revised and reissued as revision 13. This revision requires concise identification of codes and standards revision/edition in the technical specification.

E. OTHER FINDINGS OR COMMENTS:

Hydrodynamic Load Analysis - A former Bechtel employee (alleger) raised questions about the adequacy of 2D versus 3D models used in the analysis of Susquehanna and Limerick containments and reactor buildings for hydrodynamic loads.

The 2D model consists of an axisymmetric finite element model for the containment and its supporting rock foundation, and a stick model supplemented by more refined models at local areas for the reactor building. The 3D model consists of a refined model for the superstructures (containment and reactor building) and a half-space model (impedance function) for the supporting rock foundation.

A review of the available documents and discussions with responsible Bechtel personnel revealed that there were merits and shortcomings in both models. Neither of them completely represent physical reality. The alleger's letter and attachment, "Summary of Critique of Enclosure 1 to BLP-23467 Technical Evaluation of 2D and 3D Models," identified the allegers disagreements with the 2D model used. There were eight major points of disagreement summarized in this critique.

1. The 2D model is an axisymmetric model which cannot properly simulate the response of the building to asymmetric loadings, which constitute a major fraction of the total number of load uses for which the structure will be analyzed. No amount of tuning will alleviate this fundamental limitation.

2. At least one 2D model must be developed and tuned for each direction of response. A minimum of three different models will have to be developed to represent the three component responses to each design loading.

3. Tuning a variety of simplistic models to match the results of a given experimental test for a given direction will not assure that for other postulated loadings the results predicted by the models are applicable to the next loading case, unless the models are tuned in a way which is consistent to each of the models. This is practically impossible.

4. It is impossible to tune a single 2D model to properly predict the response in two or three directions simultaneously. For example, the present vertical 2D model developed for the hydrodynamic load evaluation of the Limerick reactor building is valid only for the predictions of vertical responses due to symmetric vertical loadings. It can be used to predict neither the horizontal components of response due to vertical symmetrical loads, nor the horizontal and vertical components of response due to asymmetric loads.

5. Simultaneous computation of two component responses in the reactor building is believed to be important, as the experimental evidence has shown that the horizontal and vertical accelerations are of the same order of magnitude. The behavior of a structure in one direction cannot be ignored at the expense of another if the magnitude of the responses in both directions is of the same order.

6. The 2D model cannot begin to represent the spatial variation in response of the structure at a given elevation. As such, the global response of the structure, which is influenced by the behavior of the floor and wall components of which it is made, is probably not accurate.

7. Since the 2D model is an axisymmetric one, the spatial variation of hydrodynamic loads around the circumference of the containment cannot be modeled. Instead, either the measured pressures along a given azimuth of the containment pool are effectively applied to the total circumference of the pool, or an "averaged" value of the instantaneous pressure distributions must be calculated and applied.

8. The 2D model cannot transmit the high frequency accelerations that the 3D model can. Estimates of the valid range of frequency fall between 10-15 H_z for the 2D and 45-50 H_z for the 3D. The 2D model must be "tuned" for a wider range of frequencies.

It was found that most of the disagreements expressed above would have been valid if the 2D model had been used throughout for all loading cases. However Bechtel's documents demonstrated that different models had been used for asymmetric load cases and for containment analysis.

ORGANIZATION: BECHTEL POWER CORPORATION
SAN FRANCISCO POWER DIVISION
SAN FRANCISCO, CALIFORNIA

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Bechtel documented their position concerning this matter in two documents, "Reasons for Selecting 2D Model Over 3D Model" and "Discussion of the Critique of Technical Evaluation of 2D and 3D Models." Both of these documents were dated July 20, 1982, and were submitted for NRC review following this inspection. The first document commented on the rationale for using the 2D model and the second document commented on the alleger's critique, point by point. Bechtel indicated that the 2D model in question was only used for the analysis of vertical responses of the reactor building to axisymmetric loads. It was never used for other purposes, such as horizontal components of response to vertical symmetric or asymmetric loads.

Item 4 of the alleger's critique, listed above, stated that "the present vertical 2D model developed for the hydrodynamic load evaluation of the Limerick reactor building is valid only for the prediction of vertical responses due to symmetric vertical loadings." In fact, this was exactly what the model was used for and no other purpose.

With respect to Item 5 of the alleger's critique, it was found to be valid in view of the inplant test measurements that showed the horizontal and vertical accelerations were of the same order of magnitude. The 2D model used cannot predict the horizontal responses as measured. As described in the same Bechtel documents above, however, the effect of this discrepancy on the final design is likely insignificant considering the relative magnitude of the other components of the design load.

In summary, it is believed that the 2D model along with a 3D model used for the containment and more refined models used for local areas in the reactor building, represents a reasonably adequate approach for design purposes.

It was also alleged that a paper entitled, "Three Dimensional Analysis of Reactor Building and Containment Structures for Hydrodynamic Loads," was submitted to the ASME Winter Annual Meeting and was subsequently withdrawn at the request of PP&L. A letter from PP&L to Bechtel's Project Engineer for the Susquehanna project, dated July 13, 1981, was reviewed. It revealed that the denial of the request to publish the said paper was based on the PP&L's company policy. No technical controversies were involved in that decision.

ORGANIZATION: BRAND-REX COMPANY
WILLIMANTIC, CONNNECTICUT

REPORT NO.: 99900325/82-01	INSPECTION DATES: 8/9-13/82	INSPECTION ON-SITE HOURS: 26

CORRESPONDENCE ADDRESS: Brand-Rex Company
Electronic and Industrial Cable Division
ATTN: Mr. G. Graeber, Vice President and General Manager
Main Street
Willimantic, Connecticut 06226

ORGANIZATION CONTACT: Mr. L. B. Roberts, Quality Assurance Manager
TELEPONE NUMBER: (203) 423-7771

PRINCIPAL PRODUCT: Wire and cable manufacturer.

NUCLEAR INDUSTRY ACTIVITIY: Commercial Nuclear production of Brand-Rex Company totals 14% of the company's production.

ASSIGNED INSPECTOR: J. Barnes for J. W. Sutton, Reactive and Component Program Section (R&CPS) — 10-15-82 Date

OTHER INSPECTORS:

APPROVED BY: I. Barnes, Chief, R&CPS — 10-15-82 Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B, and 10 CFR Part 21.

B. SCOPE: This inspection was performed to review the status of previous inspection findings, followup of a 10 CFR Part 21 report, manufacturing process control-armor cable repair and audits.

PLANT SITE APPLICABILITY: 50-312

ORGANIZATION: BRAND-REX COMPANY
WILLIMANTIC, CONNECTICUT

REPORT NO.: 99900325/82-01	INSPECTION RESULTS:	PAGE 2 of 5

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 4.0 of Brand-Rex (BRC) Procedure QA 822, a review was not performed by the QA Manager with respect to material which had been identified as defective by Sacramento Municipal Utility District (SMUD). This review was not performed as a result of the apparent failure of BRC personnel to inform the QA Manager of the condition, in order for the requirements of Procedure QA 822 to be implemented.

2. Contrary to Criterion V of Appenix B to 10 CFR Part 50 and paragraphs 1.0 and 3.0 of BRC QA Procedure 823:

   a. Records do not exist that would enable the foreman to determine if the brazing operator had been trained and qualified prior to performing the brazing function.

   b. The requalification schedule and schedule of qualified operators were not available within the Quality Control area and foreman station.

   c. Records do not exist to indicate that operators had completed the established training program.

   d. Records do not exist that would indicate that Quality Control examined and tested the qualification braze for bond strength.

3. Contrary to Criterion IX of Appendix B to 10 CFR Part 50, a brazing procedure had not been generated, approved, or qualified prior to the performance of brazing repair operations on armor cable.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Violation A (81-01): Implementation of 10 CFR Part 21 - practice was not consistent with paragraph 21.6 of 10 CFR Part 21.

   The NRC inspector reviewed the corrective action taken by BRC as outlined in their letter of March 27, 1981. The inspector verified that posting of Section 206 in conspicuous areas has been accomplished.

ORGANIZATION: BRAND-REX COMPANY
WILLIMANTIC, CONNECTICUT

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2. (Closed) Violation B (81-01): The vendor did not provide for evaluating deviations or informing licensee of defects as required by 10 CFR Part 21, paragraph 21.21(a).

   The NRC inspector reviewed the revised BRC QA Procedure 822, dated May 1981, for content and determined that the revised procedure complied with the provisions of 10 CFR Part 21, paragraph 21.21(a).

3. (Closed) Nonconformance A (81-01):

   a. Temperature of solder pot at Inspection Station No. 5 was not being maintained between 500-600° F. The NRC inspector verified that all solder pots throughout the plant were being maintained at the temperatures as outlined in QC Procedure 146. The solder pots have been relocated and protected from varying plant temperatures.

   b. Solder pot test results had not been recorded in the Irradiation Daily Log. The NRC inspector reviewed the Irradiation Daily Log Book for qualifying entries and found that the entries were up-to-date and being monitored and stamped off by QC/QA personnel.

4. (Closed) Nonconformance B (81-01): Material had been moved to the interlock armor repair area without the signature of the foreman on the repair request.

   The NRC inspector verified by review of documentation, revised manufacturing procedures, and Operating Instruction 023 that the corrective action stated in BRC's letter of May 26, 1982, has been complied with as stated.

5. (Closed) Nonconformance C (81-01): Guideline missing from extruding guideline book.

   The NRC inspector reviewed the revised manufacturing procedure and Operating Instruction OI-020, "Extrusion Operating Guide," and observed the extrusion operation in the plant for compliance. The NRC inspector found that the new instruction is being adhered as required by the procedure.

6. (Resolved) Unresolved Item (81-01): Solder pot test and testing procedures in irradiation area differ regarding the samples to be subjected to the solder pot test.

   The vendor has issued a revised procedure, 01-075, Revision 0, dated February 1982 titled, "Quality Checks - Irradation." This procedure indicates the sampling procedure and testing criteria to be followed.

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WILLIMANTIC, CONNECTICUT

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7. (Resolved) Unresolved Item (81-01): Unable to ascertain the validity of criteria used to conclude nonnotification of all purchasers was required with respect to testing deficiencies in irradiated armor clad cable.

   The inspector reviewed documentation consisting of a computer run of all interlock armor cable manufactured during the period of May 25, 1979, to present. The computer run indicated that Duke Power Company was the only customer for this type of cable.

E. OTHER FINDINGS OR COMMENTS:

1. Followup on 10 CFR Part 21 Report:

   SMUD filed a 10 CFR Part 21 report regarding a potential problem with one cable reel, K25, a two conductor, shielded #16 AWG cable. The potential problem was identified as a white powder covering the cable. The insulation appeared to be deteriorating due to being subjected to adverse environmental conditions.

   The NRC inspector requested to review BRC's in-house activities pertaining to this identified problem. He was informed by the QA Manager that BRC's QA Department had not been notified of this condition. Further investigation and discussion indicated that the West Coast Sales Department of BRC had been contacted by SMUD, and that a sample of the cable was taken and forwarded to the Willimantic, Connecticut, BRC Engineering Department for evaluation. At this point, it was evident that a breakdown of BRC's internal reporting requirements, as stated in QA Procedure 822, had occurred. The NRC inspector was informed that the cable was being tested and that the results would be forwarded to all parties as soon as they are received from the testing laboratory. As a result of the breakdown of BRC's internal reporting procedure, a nonconformance was identifed (see paragraph B.1 of Inspection Results).

2. Manufacturing Process Control - Armor Cable Repair:

   During the review of BRC's corrective action pertaining to repair of armor cable, the NRC inspector witnesssed the repair of some armor cable. A request was made to see the qualified procedure being used for the brazing operation of the cable repair. The NRC inspector was informed that a written, qualified procedure was not available. One nonconformance was identified (see paragraph B.3 of Inspection Results).

   Armor Cable Repair Procedure QA 823, dated October 1981, clearly delineates that qualification of both the operator and procedure

ORGANIZATION: BRAND-REX COMPANY
WILLIMANTIC, CONNECTICUTT

REPORT NO.: 99900325/82-01	INSPECTION RESULTS:	PAGE 5 of 5

is required. As a result of the absence of operator qualification and training records a further nonconformance was identified (see paragraph B.2 of Inspection Results).

3. Audits:

The NRC inspector reviewed BRC's QA Manual Section XVIII, "Audits," Revision 4, April 1979, and detailed audit procedures and instructions used for system audits.

The NRC inspector reviewed management audits for 1981-1982 and 15 internal audits that had been conducted. Also reviewed was the corrective action taken as a result of the above audits. As a result of this review, the NRC inspector determined that internal and management audits were being performed in accordance with QA program requirements.

ORGANIZATION: BROWN BOVERI ELECTRIC, INC.
SWITCHGEAR SYSTEMS DIVISION
SPRING HOUSE, PENNSYLVANIA

REPORT NO.: 99900740/82-01	INSPECTION DATE(S) 10/4,5, & 8/82	INSPECTION ON-SITE HOURS: 10

CORRESPONDENCE ADDRESS: Brown Boveri Electric, Incorporated
Switchgear Systems Division
ATTN: Mr. D. D. Duvall, Vice Pres. - Operations, BBEL
Norristown Road and Route 309
Spring House, PA 19477

ORGANIZATIONAL CONTACT: Mr. E. W. Rhoads, Manager, Quality Assurance
TELEPHONE NUMBER: (215) 628-7660

PRINCIPAL PRODUCT: Switchgear

NUCLEAR INDUSTRY ACTIVITY: Details were not obtained during this inspection; however, supplying spares and reworking delivered hardware is ongoing.

ASSIGNED INSPECTOR: C J Hale/for 11/16/82
W. E. Foster, Reactive and Component Program Section (R&CPS) Date

OTHER INSPECTOR(S):

APPROVED BY: C J Hale/for 11/16/82
I. Barnes, Chief, R&CPS Date

INSPECTION BASES AND SCOPE:

A. BASES: Appendix B of 10 CFR Part 50, and 10 CFR Part 21.

B. SCOPE: This inspection was conducted as a result of the issuance of two 10 CFR Part 50.55(e) reports by Duke Power Company. The reports indicated that the SA-1 relays (manufactured by Westinghouse) would not pass the full surge withstand requirements of ANSI C37.90-1978. These relays are used in switchgear manufactured by Brown Boveri Electric, Inc., (BBEL) that have been furnished to the following nuclear stations: (1) Catawba, Units 1 and 2; and McGuire, Unit 1.

PLANT SITE APPLICABILITY:

Docket Nos.: 50-413/414; 50-370; 50-269/270; 50-491/492; and 50-528, 529, 530, 592, and 593.

ORGANIZATION: BROWN BOVERI ELECTRIC, INC.
SWITCHGEAR SYSTEMS DIVISION
SPRING HOUSE, PENNSYLVANIA

REPORT NO.: 99900740/82-01	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATION:

Contrary to Section 21.51(b) of 10 CFR Part 21 dated December 18, 1981, records of evaluation had not been prepared with respect to the deficiencies identified with the Westinghouse relays, Types CO-6 and SA-1. These relays have been incorporated into switchgear manufactured by BBEL and supplied to various nuclear power stations.

This is a Severity Level V violation (Supplement VII).

B. NONCONFORMANCE:

Contrary to BBEL Switchgear Systems Division's corrective action response letter dated February 5, 1982, the record of evaluation had not been completed and personnel had not been instructed to initiate records of evaluation as evidenced by the lack of documents to support the statements.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTIONS FINDINGS:

1. (Closed) Violation (81-02): Record of evaluation, as required by 10 CFR Part 21, had not been prepared. The NRC inspector determined that the commitments made in the corrective action response letter dated February 2, 1982, had not been honored (see paragraph B).

2. (Open) Nonconformance (81-02): Crimped terminal lugs on nuclear switchgear were not being inspected 100%. The NRC inspector verified that Quality Assurance Procedure No. 10.7 had been revised; however, there was insufficient time to travel to the Chalfont facility to verify its implementation. Verification of implementation will be accomplished during a subsequent inspection.

E. OTHER FINDINGS OR COMMENTS:

1. Followup on Regional Requests:

a. Duke Power Company filed two 10 CFR Part 50.55(e) reports dated November 13 and November 16, 1981, with the Nuclear Regulatory Commission, Region II. The reports indicated that the Type SA-1 relays, manufactured by Westinghouse, would not pass the full

surge withstand requirements of ANSI C37.90-1978. These relays are used in switchgear manufactured by BBEL and had been supplied to the following nuclear stations: (1) Catawba, Units 1 and 2; and (2) McGuire, Unit 1.

Westinghouse has developed a modification kit to correct the deficiency and the identified hardware is in the process of being corrected.

b. Records indicate that BBEL had furnished deficient Type SA-1 relays to Cherokee and Oconee Nuclear Power Stations, also. Statements by the Quality Assurance Manager suggest that there are more relays that have not been located.

As in the above case, Westinghouse informed BBEL in a letter dated January 5, 1979, of an operating time problem in the Class 1E Type CO-6 relays. In both instances, Westinghouse requested that BBEL evaluate the deficiencies to "determine . . . reportability to the NRC Under 10 CFR Part 21." BBEL had not transferred this responsibility, nor had they performed the evaluations as evidenced by the lack of records of evaluation. Records indicate that the SA-1 and CO-6 relays were returned to Westinghouse for modification.

c. This part of the inspection was accomplished by evaluating the following documents for requirements and/or implementation of requirements: (1) eight quality assurance procedures; (2) five letters; (3) one each purchase order and specification; and (4) three other documents identified as: (a) approved vendor supply list; (b) supplier quality assurance certification; and (c) sales order. This activity resulted in the identification of the violation detailed in paragraph A.

2. Followup on Nonconformances/Violations:

The NRC inspector was presented a file and informed that it was the record of evaluation. The file contained internal memoranda, letters to and from the customer, and various other documents. Nothing in the file identified: (1) steps taken during performance of the evaluation; (2) personnel or departments performing the evaluation; (3) reviewer/approver of the evaluation; or (4) the conclusions of the evaluation.

ORGANIZATION: BROWN BOVERI ELECTRIC, INC.
SWITCHGEAR SYSTEMS DIVISION
SPRING HOUSE, PENNSYLVANIA

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The QA Manager presented completed records of training that indicated personnel had been instructed regarding separation requirements. Nothing was presented to show that personnel responsible for evaluating deficient conditions had been instructed to prepare and maintain records of evaluation.

During a discussion, the QA Manager referred to the steps taken to correct the hardware and instruction given to personnel regarding separation requirements. The NRC inspector stated that the applicable problems were, however, lack of: (1) a record of evaluation; and (2) lack of documentation to support the statement that personnel had been instructed to fully comply with existing procedures. The NRC inspector again informed the QA Manager that a record of evaluation should contain: (1) steps taken, (i.e., analysis, calculations, testing), or other measures deemed appropriate; (2) identification of personnel: (a) reviewing; (b) performing; and (c) approving; and (3) conclusions reached as a result of the evaluation. This activity resulted in the identification of the nonconformance detailed in paragraph B.

Approximately 15 minutes before the exit interview, the QA Manager presented an "Inter-Office Memo" to the NRC inspector. The document was: To: E. W. Rhoads, From: P. Belfatto, Date: October 6, 1982, Subject: Isolation of Wire Packs on 52187, Record of Evaluation. In the judgement of the NRC inspector, the document is not representative of a record of evaluation; despite its title.

ORGANIZATION: BROWN BOVERI ELECTRIC, INC.
DISTRIBUTION APPARATUS DIVISION
HORSHAM, PENNSYLVANIA

REPORT NO.: 99900743/82-01	INSPECTION DATE(S) 10/6&7/82	INSPECTION ON-SITE HOURS: 16

CORRESPONDENCE ADDRESS: Brown Boveri Electric, Incorporated
Distribution Apparatus Division
ATTN: Mr. D. D. Duvall, Vice President-Operations, BBEL
Norristown Road & Route 309
Spring House, PA 19477

ORGANIZATIONAL CONTACT: Mr. R. R. Conrad, Manager - Quality Assurance
TELEPHONE NUMBER: 215/674-5990

PRINCIPAL PRODUCT: Protective Relays

NUCLEAR INDUSTRY ACTIVITY: Details were not obtained during this inspection; however, supplying spares and reworking delivered hardware are ongoing.

ASSIGNED INSPECTOR: W. E. Foster — 11/23/82
W. E. Foster, Reactive & Component Program Section (R&CPS) — Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes — 11/23/82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: Appendix B of 10 CFR Part 50.

B. SCOPE: This inspection was made as the result of the issuance of two 10 CFR Part 50.55(e) reports and one reportable occurrence report by the Tennessee Valley Authority. The reports pertained to deficient over and/or undervoltage relays that had been furnished to Bellefonte, Units 1 and 2, and Browns Ferry, Unit 1.

PLANT SITE APPLICABILITY:

Docket Nos.: 50-313,368; 50-293; 50-261; 50-400/401; 50-324/325; 50-440/441; 50-373/374; 50-255; 50-329/330; 50-341; 50-155; 50-334,412; 50-331; 50-335,389;
(cont. on next page)

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ORGANIZATION: BROWN BOVERI ELECTRIC, INC.
DISTRIBUTION APPARATUS DIVISION
HORSHAM, PENNSYLVANIA

REPORT NO.: 99900743/82-01	INSPECTION RESULTS:	PAGE 2 of 6

PLANT SITE APPLICABILITY: (Cont.) 50-250,251; 50-458,459; 50-219; 50-289; 50-344; 50-220,410; 50-263; 50-546/547; 50-395; 50-327/328; 50-312; 50-445/446; 50-259; 50-500; 50-266,301; 50-460,513; 50-413/414; 50-438/439; 50-269/270; 50-244; 50-498/499; and 50-369.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraphs 2.4 and 3.1 of Test Procedure No. RC-3047, Revision 8, dated August 23, 1978, and attendant data sheets of completed units:

   a. Data had not been entered in the data sheets, dated March 27, 1982, to indicate the change to 48Vdc control power, for the following completed units: (1) Catalog No. 211B4175D, Serial Nos. 2128 and 2173; and (2) Catalog No. 211B6175D, Serial Nos. 2397, 2473, and 3001.

   b. The voltage value recorded in the data sheet, dated March 27, 1982, for Catalog No. 211B6175D, Serial No. 3001, did not satisfy the minimum requirement of 115 volts as evidenced by the recording of "1" in the data sheet.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraphs 3.1, 3.2, and 3.3 of Quality Assurance Procedure (QAP) No. 3.4H, Revision 0, dated December 20, 1978, regarding engineering drawings that had been released to accomplish modification tasks (of customer returned hardware) by the manufacturing department:

   a. Release forms had not been filled out to indicate what was being released and what actions were required.

   b. The drawings had not been approved by the Engineering Manager or his representative, as evidenced by the signature of the Quality Assurance Manager in the approval block of the drawings.

   The foregoing pertains to the following drawings, which are examples: (1) 211-001, Revision 0, dated April 14, 1981; (2) 211-002, Revision 0, dated April 4, 1981; (3) 211-004, Revision 1, dated October 13, 1981; (4) 211-005, Revision 2, dated June 26, 1981; and (5) 211-007, Revision 1, dated April 14, 1981.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 3.4 of QAP No. 10.9H, Revision 0, dated January 2, 1979, wave solder and subassembly inspections had not been documented as evidenced by the lack of records to indicate accomplishment of these activities.

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 3.4 of QAP No. 10.1H, Revision 0, dated December 19, 1978, reinspection of affected characteristics (component removal/replacement and hand soldering) had not been performed on hardware returned by the Tennessee Valley Authority for modification as evidenced by the lack of inspection records to confirm accomplishment.

5. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 3.1 of QAP No. 5.1H, Revision 0, dated January 4, 1980, management and supervisory personnel had not assured that all activities affecting quality had been prescribed in a documented form, as evidenced by the noninitiation of the following QAP's which appeared in the indices of various sections of the QAP Manual (Nos. 10.9.2, "Subassembly Inspection," 9.2.4, "Component Mounting Methods," 6.2H, "Control of Inspection and Test Procedures," and 15.3H, "Repair and Modifications").

   With the exception of QAP 6.2H, the indices reflected revision levels and dates for the aforementioned documents.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

(Closed) Nonconformance (81-02): The organization chart incorporated into the Quality Assurance Manual and Quality Assurance Procedure, dated June 1981, did not agree with the chart submitted with the corrective action response letter dated April 8, 1981.

The NRC inspector verified by interview (of the QA Manager) that the three persons responsible for responding to the NRC had been reminded to inform the NRC of revisions to commitments.

ORGANIZATION: BROWN BOVERI ELECTRIC, INC.
DISTRIBUTION APPARATUS DIVISION
HORSHAM, PENNSYLVANIA

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E. OTHER FINDINGS OR COMMENTS:

Followup on Regional Requests

1. The Tennessee Valley Authority (TVA) filed a 10 CFR Part 50.55(e) report, dated February 2, 1981, with the Nuclear Regulatory Commission, Region II (NRC, RII); the final report is dated August 5, 1982. The report pertained to deficient solid-state alternating current relays used in the 6.9 kilovolt switchgear at the Bellefonte Nuclear Station. The deficiency became apparent with the loss and restoration of direct current control power which would allow the auxiliary relay to "become energized long enough to initiate the supply feeder breaker trip sequence" upon a false undervoltage indication.

   This condition affects 35 nuclear plants with only 6 having identified the problem. Brown Boveri Electric, Incorporated (BBEL) had not informed the other 29 affected nuclear plants or the NRC. BBEL maintains that the deficient condition is an application problem; however, the available information does not support that position. Records indicate that Mr. W. Laudan of the NRC contacted Mr. C. Downs of BBEL on September 20, 1982, requesting identification of all nuclear plants that use the ITE-27 relays susceptible to the direct current control power loss.

   Corrective actions and preventive measures entail: (1) modifying the hardware; and (2) a modified design. Modification of the relays has been completed for the following nuclear power plants: (1) Catawba; (2) Ginna; (3) McGuire; and (4) Oconee. Modification of the relays from Bellefonte is underway while the items at South Texas are under discussion. Corrective actions and preventive measures appear adequate.

2. TVA filed a reportable occurrence report dated February 12, 1982, with the NRC, RII. The report pertained to under/overvoltage relays with trip set points below the allowable minimum. These devices are located on the 4.0 kilovolt shutdown boards at the Browns Ferry Nuclear Plant.

   It appears that the problem results because the: (1) devices are being used at the extreme limit of their capability; and (2) calibration methodology at site is somewhat less than required. TVA has revised the specification and BBEL has developed a relay that complies with the revised specification in an attempt to resolve the problem.

ORGANIZATION: BROWN BOVERI ELECTRIC, INC.
DISTRIBUTION APPARATUS DIVISION
HORSHAM, PENNSYLVANIA

REPORT NO.: 99900743/82-01	INSPECTION RESULTS:	PAGE 5 of 6

This item will be evaluated during future inspections to determine the adequacy of the corrective actions and preventive measures.

3. TVA filed a 10 CFR Part 50.55(e) report dated June 28, 1982, with NRC, RII. The report pertained to two each undervoltage and overvoltage relays which "failed to function during construction testing." The relays are installed in the 6.9 kilovolt switchgear at Bellefonte Nuclear Plant, Unit 2.

   BBEL was not aware of this condition at the time it was brought up by the NRC inspector. They were able to obtain some information prior to the close of the inspection; however, its receipt coupled with their not having the failed hardware to conduct an analysis prevented an evaluation by the NRC inspector. This evaluation will occur during a future inspection.

4. During the course of the inspection, the Quality Assurance Manager of the Horsham facility had comments regarding the following nonconformances:

   a. B.1.b - It is his contention that only a checkmark is required for the 115V indication because it is under the "Functional" heading of the data sheet; however, this position does not agree with the procedure or practice. Paragraph 3.1 (under heading of "Procedure") of Test Procedure No. RC-3047, Revision 8, dated August 23, 1978, requires that the input volts be varied to determine pickup point "and record on data sheet (115V min)." Also, the NRC inspector reviewed a minimum of 24 additional data sheets of completed hardware and observed that values in excess of 115 volts had been recorded.

   b. B.2 - He maintains that these were special drawings initiated to perform modifications to hardware which had been returned by the purchaser. As such, the quality assurance program contained no provisions. He also stated that he was given the responsiblity for coordinating the task between engineering, manufacturing, and quality assurance. In response to query, he indicated that he was not approving the drawings as the Engineering Manager's representative.

c. B.3.4 - The Quality Assurance Manager maintains that: (1) inspections and reinspections are performed; and (2) defects are identified and corrected during these inspections and reinspections. It is simply that no records of these activities are initiated. The NRC inspector informed the Quality Assurance Manager that this indicated non-compliance with Appendix B to 10 CFR Part 50.

5. This inspection was accomplished by evaluating the following documents for requirements and/or implementation of requirements: (1) nine each, letters and quality assurance procedures; (2) quality assurance manual; (3) three test procedures; (4) eight drawings; and (5) numerous documents identified as: test data sheets, nonconformance report, failure evaluation, special requirements, criteria for under/overvoltage relays, returned goods authority, and certificates of conformance. This activity resulted in the identification of five nonconformances detailed in paragraph B.

ORGANIZATION: CHICAGO BRIDGE & IRON COMPANY
BIRMINGHAM, ALABAMA

REPORT NO: 99900097/82-01	INSPECTION DATE(S) 7/19-22/82	INSPECTION ON-SITE HOURS: 27

CORRESPONDENCE ADDRESS: Chicago Bridge & Iron Company
ATTN: Mr. J. G. Tucker - District Engineering Manager
1500 North 50th Street
Birmingham, Alabama 35201

ORGANIZATIONAL CONTACT: Mr. R. Bentley, Engineering Coordinator
TELEPHONE NUMBER: (205) 595-1191, ext. 360

PRINCIPAL PRODUCT: Reactor Containment Buildings, Containment Building Liners and Personnel and Escape Locks

NUCLEAR INDUSTRY ACTIVITY: Commercial nuclear production of the Birmingham, Alabama, plant represents 20% of its production.

ASSIGNED INSPECTOR: Wm D. Kelley — 10/12/82
W. D. Kelley, Reactive & Component Program Section (R&CPS) — Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes — 10/20/82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B

B. SCOPE: This inspection was made as a result of the identification by the Sacramento Municipal Utility District of the failure of the reactor building personnel lock interlock furnished to the Rancho Seco Nuclear Generating Station, Unit 1.

PLANT SITE APPLICABILITY:

50-312

ORGANIZATION: CHICAGO BRIDGE & IRON COMPANY
BIRMINGHAM, ALABAMA

REPORT NO: 99900097/82-01	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Sacramento Municipal Utility District (SMUD) - Rancho Seco Nuclear Generating Station, Unit 1 - Problem reported was failure of the reactor building personnel lock interlock.

   a. Background - The NRC Region V inspector reported on January 30, 1982, that during entry into the reactor building for snubber maintenance inspection, the personnel lock interlock failed by permitting both interior and exterior doors to open simultaneously, thus breaching containment.

   b. Findings

      (1.) The NRC inspector reviewed the Chicago Bridge & Iron Company (CB&I) instruction manual and drawings for the SMUD, Rancho Seco Nuclear Generating Station reactor building personnel lock. As a result of this review and discussions with applicable CB&I personnel, the following findings were made:

         (a) The CB&I instruction manual for the Rancho Seco Nuclear Generating Station included cautionary statements with respect to the necessity for personnel to be familiar with and comply with the operating procedure and maintenance instructions.

         (b) CB&I manufactured personnel locks have limit switches installed, that indicate when the door latches are in the closed position. Limit switches are not installed, however, which would specifically confirm door closure. If door rebound occurs because of rapid closure, a failure to secure the door could occur as a result of the door latch closing in front of and not behind the door roller bracket assembly. The limit switches

ORGANIZATION: CHICAGO BRIDGE & IRON COMPANY
BIRMINGHAM, ALABAMA

REPORT NO.: 99900097/82-01	INSPECTION RESULTS:	PAGE 3 of 4

would still be actuated in this circumstance and would indicate door latches were in the closed position.

(c) Reportedly, SMUD contacted CB&I in 1974 concerning a problem with the personnel lock door gasket, but CB&I was unaware of SMUD having a problem with the interlock. The NRC inspector was additionally informed that CB&I was aware the latch could be actuated and not engage the door latch assembly, if the door was closed rapidly and the interlock mechanism was not properly adjusted.

(d) The NRC inspector requested to see the customer purchase order and design specification for the Rancho Seco Nuclear Generating Station personnel lock and was informed that the purchase order was located at the CB&I corporate office in Oak Brook, Illinois, and the design specification was filed in the CB&I permanent document file in Houston, Texas.

(2.) Reportedly, several licensees had contacted CB&I regarding problems with their personnel lock, and CB&I had advised the licensees that proper adjustment and maintenance of the mechanisms and gaskets would assure proper and leak-free operation. The NRC inspector requested to see the correspondence with licensees concerning reported problems and was informed there was no documentation of these contacts.

(3.) The NRC inspector was informed that CB&I had duplicated the failure of the personnel lock door latch to secure the door roller bracket assembly in their shop. The testing was stated, however, to have demonstrated that when the personnel lock was fabricated in accordance with approved engineering drawings with the mechanisms properly adjusted, failures did not occur.

(4.) CB&I changed the personnel lock door gasket design in 1980 from two rectangular solid elastomer gaskets installed in separate grooves, to a single "dog tooth" elastomer gasket in a single groove. Reportedly, a rapidly closed personnel lock door would rebound less with the new gasket design. CB&I did not notify previous customers of the new "dog tooth" gasket design because it would not fit in the existing gasket grooves in their personnel locks.

(5.) The NRC inspector reviewed the CB&I basic instruction manual for the personnel and escape locks, issued June 1980, to

ORGANIZATION: COLT INDUSTRIES
FAIRBANKS MORSE ENGINE DIVISION
BELOIT, WISCONSIN

REPORT NO.: 99900300/82-01	INSPECTION DATE(S) 8/23-27/82	INSPECTION ON-SITE HOURS: 26

CORRESPONDENCE ADDRESS: Colt Industries
Fairbanks Morse Engine Division
ATTN: Mr. J. M. Moriarty, Manager, Utility Sales
701 Lawton Avenue
Beloit, Wisconsin 53511

ORGANIZATIONAL CONTACT: Mr. E. L. Fay, Manager, Quality Assurance
TELEPHONE NUMBER: (608) 364-4411

PRINCIPAL PRODUCT: Skid-Mounted Diesel Generator Sets

NUCLEAR INDUSTRY ACTIVITY: Approximately 20% for 1982, based on sales.

ASSIGNED INSPECTOR: R.E. Oller — 10-24-82
R. E. Oller, Reactive and Component Program Section (R&CPS) — Date

OTHER INSPECTORS(S):

APPROVED BY: J. Barnes — 10-25-82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and 10 CFR Part 21

B. SCOPE: Status of previous inspection findings; manufacturing process control; procurement document control; nonconformances and corrective action; and 10 CFR Part 21.

PLANT SITE APPLICABILITY: Hope Creek Units 1 and 2; Dockets 50-354 and 50-355.

ORGANIZATION: COLT INDUSTRIES
FAIRBANKS MORSE ENGINE DIVISION
BELOIT, WISCONSIN

REPORT NO.: 99900300/82-01	INSPECTION RESULTS:	PAGE 2 of 5

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Violation (81-01): Contrary to paragraph 21.6 of 10 CFR Part 21, current copies of 10 CFR Part 21 had not been posted in a conspicuous place in six different departmental buildings, and Section 206 of the Energy Reorganization Act of 1974 had not been posted in the Large Engine Building.

   The NRC inspector verified that in accordance with the vendor's response letter dated July 24, 1981, the Manager, Quality Engineering-Nuclear, had received current copies of 10 CFR Part 21 and Section 206 from the Manager, Utility Sales, and had posted these documents in the required locations.

2. (Closed) Nonconformance A (81-01): Failure by the tool crib attendant to submit standard measuring devices (i.e., plug gages and micrometers) to the QC gage calibration during the calendar month the calibration due date occurs. Also, failure by employees to return standard micrometers to the Departments 201 and 551 tool cribs by the end of the maximum time (3 days) for short term issue, as required by F.M.E.D's Standard Practice Number 400.10, dated April 1976.

   The NRC inspector verified that in accordance with the vendor's response letter dated October 19, 1981, the gaging program, as specified in Standard Practice No. 400.10, is now being fully implemented. Examination of several thread gages, ring gages and micrometers, and the calibration recall record verified that standard measuring devices are now being calibrated within the required period. Also, review of the charge-out slips for six micrometers verified that the devices are not being retained by the employees beyond the maximum time allowed.

3. (Closed) Nonconformance B (81-01): Failure to post correction factors for the thermostat settings and the thermometer readings on the welding electrode ovens, as required by Quality Engineering Instruction (QEI) No. 0056.

The NRC inspector verified that in accordance with the vendor's response letter dated October 19, 1981, QEI No. 0056 was revised, effective October 13, 1981, and now specifies that, "When required, temperature correction factors are to be posted on the front of oven doors." Observations of eight ovens in Department 551 and eight ovens in Department 201 tool cribs verified that all of the ovens now are labeled, "No Correction Factors Required."

4. (Closed) Nonconformance C (81-01): Failure to complete, sign, and file calibration certificates for five welder power sources, which had been calibrated, as required by Manufacturing Engineering Standard No. 03:54:02, dated April 30, 1980.

   The NRC inspector verified that in accordance with the vendor's response letters dated August 10 and October 19, 1981, the requirements for completion and filing of the subject certificates are now being complied with. Review verified that certificates, dated November 1981, July and August 1982, for the above power sources, were complete and on file.

E. OTHER FINDINGS OR COMMENTS:

1. Manufacturing Process Control: The NRC inspector reviewed the Colt Industries, Fairbanks Morse Engineering Division, ASME QA Manual and their Standard QA Manual. Included in each manual were eight similar sections, which were applicable to parts manufacture, welding, nondestructive examination, inspection, assembly of diesel engine generator sets, and testing.

   Observations were made of inprocess welding fabrication and inspection of air start tanks and a coolant and lube oil piping system for the Hope Creek site, Units 1 and 2 diesel engine generator sets.

   To verify that the diesel engine generator sets are manufactured, inspected, and tested, and the results are documented in accordance with requirements, a review was made of: ASME Certificates of Authorization for the use of "N," "NPT," and "NA" symbols; three quality control instructions; operation sheet travelers controlling the welding fabrication of air start tanks for the Hope Creek Site, Units 1 and 2 diesel engine generators; four welding procedure specifications and the supporting procedure qualification records; qualification records for two ASME code welders; qualification records for two NDE Level II technicians; process control documents, consisting of the operation sheet traveler, bill of material, fabrication drawing and legend sheet for inprocess welding of a coolant and lube oil piping system; an operation sheet and drawing for inprocess fabrication of a filter lube oil assembly; and records for a

ORGANIZATION: CHICAGO BRIDGE & IRON COMPANY
BIRMINGHAM, ALABAMA

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verify that the rebound of the personnel lock door had been addressed. Paragraph 411.1 of the manual states that rebound of the door is normal and cautions that the amount of rebound depends on how fast the door is closed, and if excessive rebound occurs the door latch may not capture the door roller assembly. The paragraph gave instructions on how the door should be checked for proper adjustment of the door mechanism.

The NRC inspector was informed that the June 1980 basic instruction manual was supplied to CB&I customers receiving personnel locks after the manual issue date.

The scope and adequacy of earlier manual instructions, in regard to door operation and mechanism adjustment, were not specifically reviewed by the NRC inspector during this inspection. The adequacy of CB&I actions after duplication of the failure in their own shop was accordingly not fully evaluated. A further review of this subject will be performed at a subsequent inspection.

2. Design Control - Reviewed two sections of the QA manual, the CB&I nuclear contract handbook, a customer's design specification, two design control procedures, one leak rate test procedure, and the stress report and design calculations for a containment personnel lock, escape lock and equipment hatch. Verified procedures had been implemented to control review, approval, release, and issuance of design documents.

3. Nonconformance/Corrective Action - Reviewed one section of the QA manual, one nonconformance control list, and the documentation of six nonconformances. Verified procedure had been implemented and corrective action had been completed on the six identified nonconformances.

ORGANIZATION: COLT INDUSTRIES
FAIRBANKS MORSE ENGINE DIVISION
BELOIT, WISCONSIN

REPORT NO.: 99900300/82-01	INSPECTION RESULTS:	PAGE 4 of 5

completed diesel engine generator, consisting of the operation sheet traveler, weld work sheets, and manufacturer's ASME Code Data Reports for four different piping systems.

Within this area, no nonconformance or unresolved items, with respect to the NRC, ASME Code, and QA program requirements, were identified.

2. Procurement Document Control: The inspector reviewed Section 4, "Procurement Document Control," in both the ASME QA Manual and the Standard QA Manual.

   To verify that procurement documents are controlled in accordance with written procedures, suitably include or reference necessary requirements for procurement of materials, equipment, and services, and require subcontractors to provide an appropriate QA program, a review was made of: two standard practice procedures controlling purchase requisitions and release for manufacture of purchased items; five engineering purchase specifications specific to the Hope Creek work; two purchase requisitions and the related purchase orders for local engine control panels; computer card purchase requisitions and the related purchase orders for three heat exchangers; the current approved vendor list; and Quality Engineering Instruction No. 011A governing the maintenance of the approved vendor list.

   Within this area, no nonconformances or unresolved items, with respect to the NRC, ASME Code, and QA program requirements, were identified.

3. Nonconformances and Corrective Action: The inspector reviewed Section 15, "Nonconforming Items," and Section 16, "Corrective Action," in the ASME QA Manual and Sections 15 and 16 of the Standard QA Manual. To verify that nonconforming items are reviewed and accepted, rejected, repaired or reworked, and that conditions adverse to quality, including the cause, are promptly identified and corrected, review was made of: six standard practice procedures applicable to the identification, control, and disposition of defective manufactured and purchased items; six inspection report/variation report (IR/VR) records for weld metal repair fabrications in piping systems; a current weekly record of outstanding IR/VR's; a quarterly report of outstanding vendor corrective action requests (VCAR); six VCAR's; and a monthly report by the Quality Engineering Manager-General to the Manager of Shop Operations, concerning review of IR/VR's for trends requiring corrective action.

   Within this area, no nonconformances or unresolved items, with respect to the NRC, ASME Code, and QA program requirements, were identified.

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4. 10 CFR Part 21: The inspector reviewed the vendor's standard practice procedure No. 714.10, "Procedure On Reporting Of Defects and Noncompliance To NRC," to verify that adequate documented measures are available to meet the reporting requirements of 10 CFR Part 21.

   Observations were made of the posted documents which are required by 10 CFR Part 21.

   Within this area, no violations with respect to 10 CFR Part 21 requirements were identified.

ORGANIZATION: COMBUSTION ENGINEERING, INC.
C-E AVERY DIVISION
NEWINGTON, NEW HAMPSHIRE

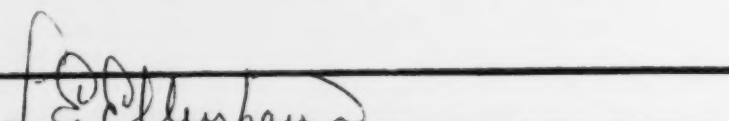
REPORT NO.: 99900259/82-01	INSPECTION DATE(S) 7/13-15/82	INSPECTION ON-SITE HOURS: 48

CORRESPONDENCE ADDRESS: Combustion Engineering, Inc.
C-E Avery Division
ATTN: P. F. Avery, Jr., President
P. O. Box 360
Newington, NH 03801

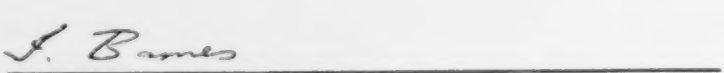
ORGANIZATIONAL CONTACT: W. R. Poteet, Manager, Quality Assurance
TELEPHONE NUMBER: (603) 431-8100

PRINCIPAL PRODUCT: Reactor Vessel Internals, Reactor Coolant Pumps, and Safety Injection Tanks

NUCLEAR INDUSTRY ACTIVITY: Current work consists of the following items: one safety injection tank for Washington Public Power Supply System's WNP-5; four reactor coolant pumps and internals for Duke Power Company, and reactor coolant pump internals for Arizona Public Service Company's Palo Verde 3.

ASSIGNED INSPECTOR:  10-1-82
T. E. Ellershaw, Reactive and Component Program Section (R&CPS) Date

OTHER INSPECTOR(S): H. W. Roberds, R&CPS

APPROVED BY:  10-4-82
I. Barnes, Chief, R&CPS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50 Appendix B

B. SCOPE: This inspection was made as a result of a potential 10 CFR Part 50.55(e) report by Washington Public Power Supply System pertaining to radiographic technique and radiography of safe end welds on Safety Injection Tanks supplied to WNP 3 and 5 not being in compliance with Sections III and V of the ASME Code.

PLANT SITE APPLICABILITY:

50-508, 50-509, 50-491, 50-528, 50-529, 50-530, 50-488, 50-566, 50-567, 50-471, and 50-382.

ORGANIZATION: COMBUSTION ENGINEERING, INC.
C-E AVERY DIVISION
NEWINGTON, NEW HAMPSHIRE

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A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS AND COMMENTS:

1. Potential 10 CFR Part 50.55(e) Construction Deficiency Report - Washington Public Power Supply System (WPPSS) made a notification to the NRC that radiography of safe end welds on Safety Injection Tanks manufactured by Combustion Engineering, C-E Avery Division, for WNP 3 and 5 is not in compliance with the ASME Code. Subsection NC of the ASME Code requires dissimilar metal weld joints to be radiographed after final postweld heat treatment. C-E Avery performed the radiography of the safe end welds prior to final postweld heat treatment. C-E Avery stated that they had misinterpreted the intent of the ASME Code and has committed to reradiograph all dissimilar metal safe end welds of all Safety Injection Tanks fabricated by them.

   At the time of this inspection, C-E Avery had reradiographed the four Safety Injection Tanks for WNP-5 and the four provided to Arizona Public Service Company's Palo Verde Nuclear Generating Station, Unit 1. The radiographs showed the welds to be acceptable.

   Reradiography of the safe end to nozzle welds on WNP-3 Safety Injection Tanks revealed cracks in Tank Nos. 3 and 4 which were not apparent in the original radiographs. These cracks require repairs.

   The tanks remaining to be reradiographed (four for each unit) are as follows: Palo Verde Units 2 and 3; Louisiana Power and Light Company's Waterford Generating Station, Unit 3; TVA's Yellow Creek Nuclear Plant, Units 1 and 2; Duke Power Company's Thomas L. Perkins Nuclear Station Unit 1, and Cherokee Nuclear Station Unit 1.

   C-E Avery has committed to report the results of the reradiography to the NRC, as they become available.

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C-E AVERY DIVISION
NEWINGTON, NEW HAMPSHIRE

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The NRC inspector reviewed all documentation associated with the welding of the safe ends to the discharge nozzles on the WNP-3 Safety Injection Tank Nos. 3 and 4, including: the manufacturing process sheets; welding procedure specifications and their qualifications; drawings; material certifications for safe ends, nozzles, and welding materials; the post-weld heat treatment procedures, and time and temperature charts. All operations were shown to have been performed in accordance with the manufacturing process sheets including the performance of radiography prior to postweld heat treatment.

C-E Avery stated that these were the only products manufactured with dissimilar metal weld joints requiring radiography.

C-E Avery's failure to correctly translate ASME Code requirements is considered to be an isolated incident. Based on the results of this inspection and the fact that this problem had already been identified with corrective action steps initiated, no nonconformances or unresolved items were identified.

It should be noted, however, that the welding procedure specification (WPS) used during the welding of the safe end to the nozzle, allowed a violation of an ASME Code supplementary essential variable. WPS DWP I-10-1.43-1, revision 00 dated January 30, 1978, allowed a maximum interpass temperature of 450°F. The procedure qualification record (PQR) shows that the WPS was qualified for an interpass temperature of 350°F maximum. At the time the welds were made (September 1978), the ASME Code did not allow an increase in interpass temperature without a requalification of the WPS being performed. The Summer 1980 addenda to the ASME Code, however, changed the supplementary essential variable to allow an increase in interpass temperature of up to 100°F without requalification being required. The qualification of the WPS is thus consistent with current ASME Code requirements.

2. Nondestructive Examination (Radiography) - As a result of Ebasco's review of C-E Avery radiographs of the safety injection tanks for WNP-3 and 5, the radiographic technique was questioned relative to ASME Code requirements. A joint review of the radiographs by Ebasco and C-E Avery Level III examiners resolved the differences in interpretation and was not considered reportable by WPPSS under the provisions of 10 CFR Part 50.55(e).

To ascertain that C-E Avery's radiographic practices were in compliance with the ASME Code, the NRC inspector reviewed 51 production radiographs

ORGANIZATION: COMBUSTION ENGINEERING, INC.
C-E AVERY DIVISION
NEWINGTON, NEW HAMPSHIRE

REPORT NO.: 99900259/82-01	INSPECTION RESULTS:	PAGE 4 of 4

and radiographic examination procedure TM-NDE-057, revision 2. The procedure TM-NDE-057 and production radiographs reviewed, appeared to meet all the requirements of Section III and V of the ASME Code.

ORGANIZATION: COMBUSTION ENGINEERING, INC.
POWER SYSTEMS GROUP
WINDSOR, CONNECTICUT

REPORT NO.: 99900401/82-02	INSPECTION DATE(S) 7/12-15/82	INSPECTION ON-SITE HOURS: 27

CORRESPONDENCE ADDRESS: Combustion Engineering, Inc.
Power Systems Group
ATTN: Mr. M. R. Etheridge, Vice Pres., Gen. Services
1000 Prospect Hill Road
Windsor, CT 06095

ORGANIZATIONAL CONTACT: Mr. C. W. Hoffman, Director, Group QA
TELEPHONE NUMBER: (203) 688-1911

PRINCIPAL PRODUCT: Nuclear Steam Supply Systems

NUCLEAR INDUSTRY ACTIVITY: The Power Systems Group, Combustion Engineering (CE) has contracts for 22 domestic reactor units to date, of which 14 are in the design and construction phase. In addition, they have modification/repair service contracts for 22 reactor units.

ASSIGNED INSPECTOR: C J Hale/for 8/20/82
R. H. Brickley, Reactor Systems Section (RSS) Date

OTHER INSPECTOR(S):

APPROVED BY: C J Hale 8/20/82
C. J. Hale, Chief, RSS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and Topical Report CENPD-210-A.

B. SCOPE: Inspection made in response to an NRC:RII request concerning a construction deficiency report of wrong solenoids supplied with coolant sampling system isolation valves for the Florida Power and Light Company's St. Lucie 2 plant. In addition, the status of previous inspection findings was inspected and a design inspection conducted.

PLANT SITE APPLICABILITY:

50-389

ORGANIZATION: COMBUSTION ENGINEERING, INC.
POWER SYSTEMS GROUP
WINDSOR, CONNECTICUT

REPORT NO.: 99900401/82-02	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Nonconformance (81-03) - Certain operations, designated on the Integrated Manufacturing Quality Plan as being mandatory hold points, were performed by the supplier without either the Power Systems Group representative being present or a written waiver being issued.

   The inspector verified the corrective action and preventive measures committed by Combustion Engineering in their letters dated January 22, 1982, and April 28, 1982; i.e., GQC representatives have been issued instructions to document the performance of Witness and Hold Points and all waivers, and an internal audit of the records on 15 additional items was conducted.

2. (Closed) Nonconformance (81-03) - Record checklist requirements were not implemented in documentation packages; e.g., required material certification reviews, material test reports of filler material, radiographs, and qualification of welders and welding procedure specifications.

   The inspector verified the corrective action and preventive measures committed by Combustion Engineering in their letters dated January 22, 1982, and April 28, 1982; i.e., Quality System Instruction No. 17.3 (Vendor Record Review) had been issued on November 25, 1982, the Record Check Lists had been corrected to show all records in the Owners Record Package, and the internal audit was completed.

3. (Closed) Nonconformance (81-03) - No in-process audits were performed during fabrication of Component Cooling Water Heat Exchangers in regard to the welding processes used.

   The inspector verified the corrective action and preventive measures committed by Combustion Engineering in their letters dated January 22, 1982, and April 28, 1982; i.e., Group Quality Control was reorganized to include an Audit Section and in-process audits of vendors are being performed.

4. (Open) Nonconformance (81-03) - Group Quality Control surveillance or record review has not verified completion or fulfillment of Code special process requirements by external suppliers.

   This item remains open pending Combustion Engineering receipt of confirmation from their vendors that the vendor's suppliers have performed the qualifications required by the ASME Code. Combustion Engineering is also waiting on a response from Ametek regarding the Charpy-V impact property certification.

5. (Closed) Nonconformance (82-01) - Two specifications did not have the required documentary evidence of interface reviews on file.

   The inspector verified the corrective action and preventive measures committed by Combustion Engineering in their letters dated May 6, 1982, and June 10, 1982; i.e., the Document Distribution/Approval (DD/A) forms have been placed in the files, memo PCE-82-031 was issued to Plant Components personnel, and Plant Components completed their review of an additional 19 specifications to confirm the availability of DD/A forms.

E. OTHER FINDINGS OR COMMENTS:

1. Coolant Sampling System Solenoid Valves - This item is a followup to a licensee (St. Lucie 2) report to the NRC that six pneumatically operated isolation valves had been installed with AC solenoid, rather than DC solenoid air control valves. If these valves fail to close during an accident, there is the potential that some radioactivity could be released.

   The inspector reviewed the records maintained by Combustion Engineering (CE) on these valves consisting of one general and one project specification, one CE Certificate of Equipment, one CE Records Checklist, one CE Surveillance Report, one vendor drawing, one vendor project plan, one vendor procedure, one vendor traveler, and one vendor certificate of conformance.

ORGANIZATION: COMBUSTION ENGINEERING, INC.
POWER SYSTEMS GROUP
WINDSOR, CONNECTICUT

REPORT NO.: 99900401/82-02	INSPECTION RESULTS:	PAGE 4 of 4

The records review disclosed that paragraph 4.6.6 of the general specification 00000-PE-707 required that 125 volt DC solenoid valves be supplied when specified on the data sheet. The data sheet for these valves did specify DC solenoids. The vendor's drawing specified an ASCO air solenoid valve, however, it did not indicate AC or DC voltage. A review of a drawing from a different vendor of similar valves disclosed that they also did not specify the operating voltage requirements. The review of these records did not disclose the reason that the CE specification requirement was not implemented by the vendor. Additional followup will be made during a future inspection at the vendor facility. As a result of this inspection, CE instructed applicable cognizant engineers to verify that the correct voltage requirements were specified on vendor drawings, or they are to obtain verification (in writing) from the vendor.

There were no nonconformances or unresolved items identified in this area of the inspection.

2. Design Inspection - The chemical volume and control system (CVCS) charging pump was selected for this inspection. To initiate inspection in this area, five specifications, four internal memoranda, four letters (between CE and the AE), seven calculations, and eight DD/A's applicable to the CVCS charging pump were examined. This inspection effort will be completed during the next regularly scheduled inspection.

ORGANIZATION: CONAX CORPORATION
BUFFALO, NEW YORK

REPORT NO.: 99900323/82-01	INSPECTION DATE(S) 10/11-15/82	INSPECTION ON-SITE HOURS: 45

CORRESPONDENCE ADDRESS: Conax Corporation
ATTN: Mr. J. Adams
President
2300 Walden Avenue
Buffalo, New York 14225

ORGANIZATIONAL CONTACT: Mr. R. L. Duroure, Manager of Quality Assurance
TELEPHONE NUMBER: (716) 684-4500

PRINCIPAL PRODUCT: Containment Electric Penetrations and Environmental Qualification Testing Services.

NUCLEAR INDUSTRY ACTIVITY: Manufacture of electric penetrations, electric conductor seal assemblies (ECSA), adapter modules for other manufacturers' penetrations, heat sensing probes, and specialized cabling for nuclear power plants, and provides environmental test facilities capable of loss-of-coolant accident (LOCA) testing Class 1E equipment. Approximately 45% of corporate activity is devoted to nuclear product manufacture and testing.

ASSIGNED INSPECTOR: J. Barnes 12-2-82
L. B. Parker, Reactive & Component Program Section (R&CPS) Date

OTHER INSPECTOR(S): J. R. Agee, Equipment Qualification Section (EQS)

APPROVED BY: J. Barnes 12-2-82
I. Barnes, Chief, R&CPS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21 and 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made as a result of the issue of a 10 CFR Part 50.55(e) report by Louisiana Power and Light (LP&L) concerning loose bolted connectors using "press-fit" pemnuts on containment electrical
(cont. on next page)

PLANT SITE APPLICABILITY: Docket Nos. 50-382, 50-482, 50-483, 50-486, 50-346, 50-445/446, 50-423, 50-374, 50-389, 50-404, 50-405.

ORGANIZATION: CONAX CORPORATION
BUFFALO, NEW YORK

REPORT NO.: 99900323/82-01	INSPECTION RESULTS:	PAGE 2 of 5

SCOPE: (Cont.) penetrations supplied by Conax Corporation for use at Waterford SES, Unit 3. Additionally, manufacturing process control and the equipment qualification program (EQP) were inspected. Areas inspected in the EQP included: evaluation of the test laboratory; examination of the design of the feedthrough/adapter module; and verification that qualification testing had been completed on the adapter module.

A. VIOLATIONS:

Contrary to paragraph 21.31 of 10 CFR Part 21, Conax Corporation (Conax) failed to specify that the provisions of 10 CFR Part 21 applied in a procurement document for irradiation services performed by Georgia Tech Neely Nuclear Research.

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 8.4.2 of Nuclear Quality Assurance (NQA) Procedure 8.4, Revision C, dated January 4, 1982, Exhibit A of NQA Procedure 14.1 was not Forms N-30 and N-30A as indicated.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraph 12.1.3(c) of NQA Procedure 12.1, Revision C, dated January 4, 1982, and the MS90 Calibration Record Logs: (a) procedures had not been written or approved by the Quality Control Manager for the calibration of the Veeco Helium Leak Detectors, and (b) serial numbers of equipment calibrated had not been recorded in the MS90 Calibration Record Logs.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 15.13 of NQA Procedure 15.1, Revision A, dated June 12, 1980, a Material Disposition Report (MDR) was not prepared and affixed to Part No. 7769-20002-01, Unit 10-8 after failure in the dielectric test.

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Reactive Item

LP&L issued a 10 CFR Part 50.55(e) report concerning loose "press-fit" pemnuts. Conax has identified five sites with a potential for the problem; i.e., Millstone, Unit 3; North Anna, Units 3 and 4; St. Lucie,

Unit 2; LaSalle, Unit 2; and Waterford, Unit 3. Conax revised the design to avoid further problems by placing a continuous weld around the peripheral edge of the nut. New brackets were sent to North Anna, Units 3 and 4; Waterford, Unit 3; and Millstone, Unit 3. St Lucie, Unit 2 and La Salle, Unit 2 drawings were changed to reflect the new design.

LP&L issued a supplement to the final 10 CFR Part 50.55(e) report concerning the workmanship of the welds used to correct the loose pemnut problem. Since welding was not being performed on domestic nuclear equipment nor were any domestic nuclear weldments inhouse at the time of the inspection, this problem will be addressed in a future inspection.

2. Manufacturing Process Control

Three design specifications, purchase orders, 10 travelers, 8 production control procedures, 6 final (partial) data packages, associated drawings, and other documentation were reviewed from the production control, quality control, manufacturing testing, and document control areas.

Nonconformances B.1 through B.3 were identified in this area of the inspection. In identifying nonconformance B.3, it was noted that two separate and distinct travelers existed for Part No. 7769-20002-01, Unit 10-8, both of which had been inspected and approved by Quality Control. The production release date of one traveler was September 17, 1982, with a dielectric test date of September 29, 1982. The production release date of the other traveler was September 30, 1982, with a dielectric test date of October 1, 1982. Subsequent to the NRC inspector's discovery of this, a note was added to the traveler with the dielectric test date of September 29, 1982, stating, "NOTE: Unit 10-8 FAIL DIELECTRIC TEST SCRAP 9-29-82," and the accepted column quantity changed from four to three. No change was made in the reject column quantity. During this portion of the inspection, it was also noted that on the traveler for Part No. 7769-21008 under "Draw Material from Stores," an incomplete part number was listed. The part number was listed as N-45076 when it should have been N-45076-01. Further examination of the assembly itself and its drawing revealed that the correct parts were being used.

ORGANIZATION: CONAX CORPORATION
BUFFALO, NEW YORK

REPORT NO.: 99900323/82-01	INSPECTION RESULTS:	PAGE 4 of 5

3. Implementation of 10 CFR Part 21

The NRC inspector observed posting with respect to 10 CFR Part 21 requirements at the vendor's facility. Procedure NQA 1.5 had been written for implementation of 10 CFR Part 21, but had not been implemented in regard to procurement paragraph 1.5.6 (see Violation, paragraph A).

4. Equipment Qualificiation Program

a. Equipment Qualification Testing Capability

The Conax equipment qualification laboratory was established to test and qualify Conax products for use in Class 1E applications in the nuclear power industry; however, the facility has been used to perform tests for other test laboratories, especially LOCA tests.

The Conax environmental qualification test laboratory is equipped to provide thermal aging, and LOCA testing at pressure, temperature, humidity, and chemical spray conditions as required by specifications and applicable IEEE Standards 323-1974, 317-1976, and 344-1975.

The laboratory subcontracts radiation aging and seismic testing to other test laboratories. The data acquisition capabilities of the laboratory are limited to a single data logger and three temperature recorders with overlapping ranges which possess the accuracies and resolutions to provide valid test data. Record logs are maintained; however, some of the annual inputs to the logs are data taken from the data logger for periods when the test is unattended. Hard copies of test data are filed in accordance with the Conax quality assurance records retention system.

b. Review of Feedthrough/Adapter Module Assemblies Design Documents

The feedthrough/adapter module assemblies were developed and qualified in accordance with parameters specified in Bechtel Material Requisition No. 7220-E-120(Q). Qualification testing was conducted in accordance with the requirements of IEEE Standards 317-1976, 323-1974, and 344-1975.

Important or critical materials in the feedthrough/adapter module assemblies included: (1) polysulfone - sealant; (2) Kapton - cable jacketing; (3) Viton - static seals; (4) Kerite - cable insulation;

(5) GDI-30F - Kulka terminal blocks (a diallyl phthalate long glass fiber filled material); and (6) WCSF-N - Raychem heat shrinkable tubing (a polyolefin with nuclear grade adhesive).

These materials were chosen following extensive investigative testing for nuclear power plant uses. Each material was tested to determine fire resistance, combustion, radiation, and thermal aging characteristics. Each material exhibited favorable characteristics relative to individual design service requirements. Conax document No. IPS-325, "Design Qualification Material Test Report for Materials Used in Conax Electrical Penetration Assemblies and Electric Conductor Seal Assemblies," contains the test data and justification for selection of these materials.

c. Review of Qualification Test Data

The NRC inspector examined the test article and the raw data from which the Conax document No. IPS-861, "Design Qualification Report for Feedthrough/Adapter Module Assemblies for Amphenol Sams Penetrations, Midland Plant, Units 1 and 2, Bechtel Power Corporation P. O. 7220-E-120, Conax Corporation w/o 7-76900," was compiled. The document contains the qualification data for the feedthrough/adapter module for the Midland Nuclear Plant. The report demonstrates that the feedthrough/adapter module assemblies met the post-LOCA type test criteria in Section 6.4 of IEEE Standard 317-1976.

ORGANIZATION: COOPER INDUSTRIES
COOPER ENERGY SERVICES
GROVE CITY, PENNSYLVANIA

REPORT NO.: 99900317/82-01	INSPECTION DATE(S) 9/20-24/82	INSPECTION ON-SITE HOURS: 29

CORRESPONDENCE ADDRESS: Cooper Industries, Cooper Energy Services
ATTN: Mr. F. B. Stolba, Vice President/General Mgr.
Reciprocating Products
150 Lincoln Avenue
Grove City, PA 16127

ORGANIZATIONAL CONTACT: Mr. C. C. Bemiller, Manager - Quality Control
TELEPHONE NUMBER: (412) 458-8000

PRINCIPAL PRODUCT: Emergency Standby Diesel Generators.

NUCLEAR INDUSTRY ACTIVITY: Numerous contracts for spare parts.

ASSIGNED INSPECTOR: W. E. Foster 11/2/82
W. E. Foster, Reactive & Component Program Section (R&CPS) Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes 11/2/82
I. Barnes, Chief, R&CPS Date

INSPECTION BASES AND SCOPE:

A. BASES: Appendix B to 10 CFR Part 50 and 10 CFR Part 21.

B. SCOPE: This inspection was made as a result of two 10 CFR Part 21 reports that had been filed by Cooper Energy Services with the Nuclear Regulatory Commission, Headquarters. The reports pertained to: (1) improperly repaired fuel nozzle holes in one power head of two diesel generators; and
(cont. on next page)

PLANT SITE APPLICABILITY:

Docket Nos.: 50-456/457; 50-454/455; 50-410; 50-528/529/530; 50-498/499; and 50-387/388.

ORGANIZATION: COOPER INDUSTRIES
COOPER ENERGY SERVICES
GROVE CITY, PENNSYLVANIA

REPORT NO.: 99900317/82-01	INSPECTION RESULTS:	PAGE 2 of 6

SCOPE: (Cont.) (2) disintegration of the mesh of the lube oil strainer basket. The latter condition affects diesel generators that have been furnished to the following nuclear generating stations: (a) Braidwood, (b) Byron, (c) Nine Mile Point, (d) Palo Verde, (e) South Texas, and (f) Susquehanna. The former was restricted to Palo Verde and Susquehanna. In order to evaluate the adequacy of the Quality Assurance Program as it relates to reported deficiencies, corrective action and manufacturing process control were also evaluated.

A. VIOLATIONS:

Contrary to Section 21.6 of Title 10, Part 21 of the Code of Federal Regulations, dated December 18, 1981, posting of the regulation had not been accomplished, nor did the posted procedure (numerous locations) identify the location where 10 CFR Part 21 could be examined. Further, the copy of 10 CFR Part 21 on file in the Quality Control Office was not current; it was dated October 19, 1978.

This is a Severity Level V violation (Supplement VII).

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraph 4.2 and its subparagraphs 1 and 2 of Quality Control Procedure (QCP)-10-14, Revision 1, dated December 10, 1980, a Material Review Request (MRR) had not been issued regarding disintegration of the lube oil strainer basket mesh.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraph 4.2 and its subparagraphs 1 and 2 of QCP-10-6, Revision 1, dated October 15, 1976, MRR 22203, dated December 2, 1980, had not been distributed to, reviewed, dispositioned, and approved by Liaison Engineering. This is indicated by the signature on Copy No. 1 of an individual who was not a member of Liaison Engineering.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraphs 2.1 and 2.2 of Quality Control Inspection Plan (QC/IP)-01C-1 ID3, Revision 19, dated December 12, 1980, a signature and an "X" had not been entered in the QC/IP to indicate verification of approved vendor seismic report for Fuel Oil Pump, Part No. 2-11P-118-003, MO/SN 2F0201, which had been processed on June 2, 1982.

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraphs 4.4.1, 4.4.2, and 4.4.3 of QCP-10-1, Revision 4, dated May 11, 1978:

a. The inspector had not entered the clock number and date in the appropriate spaces for completed operations on pages 1 and 2 (columns 2-6, 2 and 3, respectively) of QC/IP-01V-3 for Part No. 2-01V-422-008, Serial Nos. 2E2602 through 2E2610. Only one clock number and date are reflected for columns 9, 10, and 11 on page 2. The QC/IP had been completed by the inspector and supervisor on June 1, 1982.

b. The inspector had not entered the dates for completed operations at columns 2 and 4 through 6 of QC/IP-SF-29 ID3 for Tubing, Part No. 2-99T-034-032, Serial No. CB 1279113. The QC/IP had been completed by the inspector and supervisor on December 17 and 20, 1979, respectively.

c. The inspector had not entered the dates for completed operations at columns 1, 2, 7, and 8 of QC/IP-02T-5 for Part No. 2-02T-255-018, Serial Nos. S68 (5 each). The QC/IP had been completed by the inspector and supervisor on March 11 and 17, 1980, respectively.

5. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and paragraph 4.5.6 of QCP-10-1, Revision 4, dated May 11, 1978, the following Certificates of Conformance (COC) for spare parts had not been signed by the Manager of Quality Control or the Manager of Quality Engineering: (1) Fuel Oil Pump, Part No. 2-11P-118-003, Serial No. 2F0201, dated June 22, 1982, for Commonwealth Edison PO No. 257849; (2) Distributor, Part No. LSV-19-3B#4, Serial No. 2F1801, dated August 3, 1982, for the PO number above; (3) Governors, Part No. 2-02G-048-001, Serial Nos. 1370292 and 1370295, dated August 26, 1982, for Louisiana Power and Light PO No. WP3-9176; (4) Valves, Part No. 2-01V-422-008, Serial Nos. 2E2602, 2E2605, 2E2606, 2E2608, and 2E2610, dated June 16, 1982, for Arizona Public Service PO No. 10407-F-144858-S-HO.

Further, the certificates are not the form shown in Exhibit D or customer-supplied equivalents.

C. UNRESOLVED ITEMS:

1. The Quality Control Department does not consistently receive copies of purchase orders for spare parts. The purchase orders address, or fail to address, documentation, specification, and original purchase order revision requirements. COC's are initiated on parts identified as

critical items, attesting to their satisfying original requirements. Also, it was noted that a COC had been initiated for governors that had been reworked at Woodward and shipped directly to the user without Cooper Energy Services (CES) personnel observing any hardware-related activity at Woodward.

Based upon the foregoing, the NRC inspector was not able to determine how COC's could be initiated: (1) with statements that attest to spare parts satisfying original requirements when the Quality Control Department does not have the information readily available; and (2) on reworked hardware that is not seen by CES personnel.

2. Departments that receive Corrective Action Requests (CAR) are required to: (1) determine the necessary corrective action, assign, and schedule the work; and (2) complete the corrective action section of the CAR by: (a) identifying the corrective action taken, (b) signing the statement, and (c) returning the CAR to the Quality Control Office within 30 days from date of issue. If the foregoing is not accomplished, the Quality Control Manager issues a reminder form. These requirements are specified in QCP-10-4, Revision 1, dated September 14, 1978.

The NRC inspector observed that numerous reminder forms had been issued on multiple CAR's. Examples of observation are:

CAR No./Date	No. of Reminders Issued
GC-1660, May 14, 1982	6
GC-1663, June 10, 1982	8
GC-1672, June 18, 1982	6
GC-1649, March 31, 1982	18

The NRC inspector noted that there were no requirements regarding: (1) limit on number of reminder forms permitted; and (2) elevating the lack of response to the appropriate managerial level. Consequently, it was not apparent how this practice could be considered as taking prompt corrective action.

D. OTHER FINDINGS OR COMMENTS:

1. Followup on Regional Requests

a. Cooper Energy Services filed two 10 CFR Part 21 reports with the Office of Inspection and Enforcement, Washington, D. C. The

reports were dated November 23, 1981, and February 1, 1982, and pertained to: (1) improper repair of a fuel nozzle hole in one power head of two diesel generators; and (2) disintegration of the mesh of the lube oil strainer basket, respectively. The improper hole repair was identified on one unit that had been supplied to: (1) Susquehanna Steam Electric Station; and (2) Palo Verde Nuclear Generating Station. The disintegration of the mesh of the lube oil strainer basket affects diesel generators that have been supplied to the following nuclear generating stations: (1) Susquehanna, (2) Byron, (3) Braidwood, (4) Palo Verde, (5) Nine Mile Point, and (6) South Texas.

Corrective actions involve replacement of: (1) improperly repaired cylinder heads, this will include the unit that has not been shipped (South Texas); and (2) lube oil strainer baskets. Preventive measures are: (1) prohibition of repair of the cylinder head between the fuel injection nozzle and valve seat inserts; and (2) redesign of the lube oil strainer basket. The corrective actions and preventive measures are considered to be adequate.

During this activity, it was determined that: (1) a Material Review Request (MRR) form had not been issued regarding disintegration of the lube oil strainer basket mesh; and (2) MRR-22203 had been initiated on the previous problem (tearing of basket mesh) and had been approved by an individual who was not a member of Liaison Engineering. Nonconformances identified during this effort are detailed in paragraphs B.1 and 2.

b. Corrective action and manufacturing process control were evaluated in order to verify the adequacy of the Quality Assurance Program as it relates to reported deficiencies.

During this activity, it was determined that documentation of quality activities was inadequate. It was also noted that the Aftermarket Operation's Nuclear Policy (Spare Parts) states in part, "only nuclear documentation identical to that supplied with the original order will be provided." Identified nonconformances are detailed in paragraphs B.3 through B.5. It was not apparent that CES quality personnel were in a position to initiate COC's: (1) on hardware that had not been observed by them; and (2) attesting to conditions when all requirements are not readily available to them. Further, it was not apparent that adequate controls

existed with the practice of issuing reminder forms on past due Corrective Action Requests. These concerns are detailed in paragraphs C.1 and C.2.

c. The aforementioned activities were accomplished by reviewing the following documents for requirements and/or implementation of requirements: (1) 1 each: (a) packing list, (b) service representative report, (c) material laboratory report, (d) shipping notice, (e) drawing transmittal, (f) receiving report, (g) factory routing card, (h) specification, (i) corrective action log, (j) engineering standard; (2) 4 each: (a) material review requests, (b) letters, and (c) corrective action requests; (3) 10 certificates of conformance; (4) 5 internal memoranda; (5) 19 quality procedures; (6) 2 sections of the quality assurance manual; and (7) 6 each: (a) drawings, and (b) quality control inspection plans.

2. Implementation of 10 CFR Part 21

The posting requirements specified by 10 CFR Part 21 consisted of the adopted procedure which incorporated details of internal reporting and Section 206 of the Energy Reorganization Act of 1974. However, the posting did not indicate where 10 CFR Part 21 was located; it was determined that the available copy of 10 CFR Part 21 was not current. This resulted in the violation detailed in paragraph A.

This activity was accomplished by reviewing: (1) two purchase orders; (2) one quality control procedure; and (3) the available copy of 10 CFR Part 21. Additionally, four bulletin boards were observed.

ORGANIZATION: E. L. MANUFACTURING PEEBLES, INC.
PEEBLES, OHIO

REPORT NO.: 99900795/82-01	INSPECTION DATE(S) 10/6-8/82	INSPECTION ON-SITE HOURS: 38

CORRESPONDENCE ADDRESS: E. L. Manufacturing Peebles, Inc.
ATTN: Mr. J. E. Lott
Vice President
P. O. Box 337
Peebles, OH 45660

ORGANIZATIONAL CONTACT: Mr. J. E. Lott, Vice President
TELEPHONE NUMBER: (513) 587-2656

PRINCIPAL PRODUCT: Steel/lead fabrication

NUCLEAR INDUSTRY ACTIVITY: Fabrication of the independent spent fuel storage casks and other casks for transportation purposes.

ASSIGNED INSPECTOR: W. M. McNeill — 11/26/82
W. M. McNeill, Reactive & Component Program Section (R&CPS) — Date

OTHER INSPECTOR(S): P. Sakowski, Reactor Systems Section

APPROVED BY: I. Barnes — 11/26/82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and 10 CFR Part 21.

B. SCOPE: Procurement control, manufacturing process control, nonconformances and corrective action, control of special processes, calibration, and 10 CFR Part 21.

PLANT SITE APPLICABILITY:

Not identified.

ORGANIZATION: E. L. MANUFACTURING PEEBLES, INC.
PEEBLES, OHIO

REPORT NO.: 99900795/82-01	INSPECTION RESULTS:	PAGE 2 of 7

A. VIOLATIONS:

Contrary to paragraph 21.21(a) of 10 CFR Part 21, procedures had not been adopted to provide for: (1) evaluating deviations or informing the licensee or purchaser and (2) assuring that a director or responsible officer was informed if the supplied basic component failed to comply or contained a defect.

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 1.2 in Section II of the QA Manual, measures were not established to assure that manufacturing operations performed by subvendors were fully in accordance with customer specifications, as evidenced by the failure to impose on subvendors the customer's specification (BP 7006QAP) prohibiting the use of halogenated materials.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 3.1 in Section IX of the QA Manual, inspection steps were not always performed in the manufacturing sequence to assure quality as evidenced by the following examples:

   (a) Inspections identified on lines 19 and 20 of the ring assembly operation sheet and the inspection identified on line 15 of the inner shell assembly operation sheet were not signed or stamped as completed, although subsequent operations were stamped as completed.

   (b) Inspection for roundness was apparently accomplished before welding of shell courses, instead of after welding as required by the operation sheets. The top inner shell roundness inspection was dated September 16, 1982, and welding was dated September 20, 1982. The bottom inner shell roundness inspection was dated September 16, 1982, and welding was dated September 17, 1982. The ring assembly roundness inspection was dated July 2, 1982, and the welding was dated July 8, 1982.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 2.2 in Section VII of the QA Manual, measures established to assure identification of materials were not fully implemented as evidenced by the following examples:

ORGANIZATION: E. L. MANUFACTURING PEEBLES, INC.
PEEBLES, OHIO

REPORT NO.: 99900795/82-01	INSPECTION RESULTS:	PAGE 3 of 7

(a) A 2-inch plate bought on Purchase Order 2953 was not marked with its heat number.

(b) Rod material, 9/16" in diameter, bought on Purchase Order 2956 had its heat lot number obliterated.

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 2.0 in Section XIV of the QA Manual, the following examples were noted where nonconforming materials had not been either identified as such or diverted from the normal production flow:

(a) Items 14, 16, 17, and 18 of Drawing 1098-1101 and Item 8 of Drawing 1098-1116 were purchased to material specifications different from that required by the design drawings. SA 182 was substituted for SA 403 and SA 193 for F593 without identification of the substitutions in a deviation report (Appendix L).

(b) A 2-inch plate bought on Purchase Order 2953 was observed in storage to have a major surface defect. This material had been accepted by receiving inspection without issuance of a deviation report.

(c) E. L. Manufacturing Peebles (EL) inspections of length and diameter characteristics had established that the outer and inner shell sections did not conform to the requirements specified in the operation sheets. No deviation report had been issued as a result of these inspection findings.

5. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 1.2 in Section II of the QA Manual, measures had not been established that would assure conformance to customer specification (BP 7007QAP) requirements with respect to covered arc welding electrode storage and maintenance of heat lot identification. During the inspection, the oven temperature was noted to be below the range indicated by the customer, and loose unidentified electrodes were observed both in the oven and clamped in a welding electrode holder.

6. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and EL Procedure PT-100, the manufacturer's certification for penetrant remover (Lot 81L110) did not report the sulphur and chloride content.

ORGANIZATION: E. L. MANUFACTURING PEEBLES, INC.
PEEBLES, OHIO

REPORT NO.: 99900795/82-01	INSPECTION RESULTS:	PAGE 4 of 7

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Procurement Control: The purchase orders applicable to the material for the REA 2023 cask were reviewed and compared to the design bill of materials. The approval of purchase orders by quality assurance was verified. The material certifications received to date were reviewed, and the use of approved vendors and an approved vendor list for the above purchase orders were verified. In this area, nonconformance B.1 was identified. EL management noted that a standard purchase clause on halogenated materials, which has been used in the past, could be applied to purchase orders. It was also noted that Part 21 had not been imposed by EL on vendors of services and materials.

2. Manufacturing Process Control:

   a. Inspection - The use of operation sheets to control manufacturing was inspected. Operation sheets and supporting procedures such as penetrant testing, welding, etc., have been issued for the fabrication of an independent spent fuel storage cask (REA 2023). It was noted that the welding and other procedures were not referenced by number and revision on operation sheets; however, EL immediately corrected the operation sheets. In this area, nonconformance B.2 was identified in regard to inspection steps not being signed off and being either dated incorrectly or performed out of sequence. It was also noted that manufacturing steps were not all signed off, in that welding on line 13 of the ring assembly operation sheet was not signed, although the welding had been performed. Weld material issuance logs did document the welder's identity. It was observed that a number of operations performed by an outside inspection agency were signed off by EL personnel instead of the outside agency. EL corrected this immediately. It was observed that the round inspection stamps were not always used as required by the QA Manual. Customer hold and witness points were verified as being followed. The identification and control of materials were inspected. Operation sheets did reflect the materials being used. Nonconformance B.3 was identified in this area. EL did take corrective action to identify the plate and rod material in question.

ORGANIZATION: E. L. MANUFACTURING PEEBLES, INC
PEEBLES, OHIO

REPORT NO.: 99900795/82-01	INSPECTION RESULTS:	PAGE 5 of 7

b. General Observations:

(1) EL is fabricating the REA 2023 cask (less the loading baskets) under contract from Brooks & Perkins (B&P). B&P is under contract to Ridihalgh, Eggers & Associates (REA), the designer, to supply a cask to the REA design. It was observed that the outer shell had been rolled and welded in two sections and was awaiting its girth weld. The inner shell had been fabricated in the same manner and had its girth weld completed. The inner cover had been fabricated including lead pour except for its bolt circle. The above was, in general, the extent of fabrication to date.

(2) It was observed that EL had taken certain exceptions to the B&P specifications with respect to requirements for stamping of welder identity on welds, prohibition of grinding prior to inspection, and helium leak testing. EL had proposed use of freon testing in lieu of helium. B&P had not responded to these exceptions as of the inspection date. The NRC inspectors questioned the proposed use of halogenated hydrocarbons (freon) as a testing gas on a stainless steel vessel.

(3) It was also noted that B&P had not identified the year and addenda of the ASME Code that was applicable to this cask and any future casks. ASME Code has been committed to by REA for the design, and ASME Section IX has been imposed by B&P on EL for welding procedure and personnel qualification. EL has also voluntarily committed to ASME Section V for nondestructive examination. However, it was noted that NB-2400 requirements had not been identified by B&P with respect to testing of welding materials. Roundness and straightness requirements had also not been specified by B&P to assure that fabrication of the vessel was consistent with the ASME Code design base.

(4) Weight of the cask is one of the few technical requirements identified by the ultimate customer; however, it was found that current plans call for only an estimation of the weight and not direct measurement. Recent estimates by REA established this characteristic to be very close to the limit of 100 tons.

ORGANIZATION: E. L. MANUFACTURING PEEBLES, INC.
PEEBLES, OHIO

REPORT NO.: 99900795/82-01	INSPECTION RESULTS:	PAGE 6 of 7

3. Nonconformances and Corrective Actions:

It was established that no nonconformances were documented on the deviation report for the REA 2023 cask project to date. A number of nonconformances were observed by the NRC inspectors. The failure to document these nonconformances is identified in B.4 above. EL took immediate action to identify the material substitutions in question to its customer for approval. In regard to the 2-inch plate, a yellow withhold tag was applied. The material was knowingly received with the material flaw and it was stated that it was planned to use the plate such that the flawed area would not be included in the part. Planning reflecting this statement had not been generated as of this inspection. In regard to the nonconforming shell sections, the nonconforming condition had been informally documented.

4. Control of Special Processes:

a. Welding - Records of welding and penetrant testing were inspected. Welding procedure specifications, procedure qualification records, and personnel qualification records were verified to comply with the QA Manual and ASME Section IX requirements. It was observed that several of the qualification records were not signed by the testing laboratory which perfomed mechanical tests. It was also observed that the welder performance log contained omissions of some welders' activities when compared to the weld material issuance logs. A review of welding material control established nonconformance B.5. EL has started to write a procedure on covered electrode exposure. The covered electrode storage oven was rebuilt by EL after the NRC inspectors' observation.

b. Penetrant Testing - At present, penetrant testing is performed by an outside inspection agency. The records of this activity were reviewed. Nonconformance B.6 was identified in this area. It was observed that the current procedure, PT-100, Revision C, was not approved by B&P; however, this approval was obtained by EL by the end of the inspection. The qualification records of the personnel were inspected. The testing procedure and reports of testing performed to date were found to be satisfactory.

5. Calibration:

The EL's instrumentation calibrations and associated records were examined. Calibrations traceable to the National Bureau of Standards

were provided through B&P and Columbus Testing Laboratory, Inc. The calibration file included a separate calibration and maintenance card for each piece of equipment. Each card included a description of the instrument, its accuracy, the calibration and maintenance history, a brief description of the calibration method, and the signature of the responsible authority. Welders and pressure gages bore calibration stickers with the instrument accuracy, calibration date, calibration due date, and the signature of the responsible authority. One welder in the shop area did not have a calibration sticker, since it was inoperable awaiting repair. The inspector recommended that the item be tagged accordingly. The welding rod oven thermometer was not calibrated. The gamma scan and associated infrequently used equipment bore "calibrate before use" stickers. These items are calibrated immediately prior to a gamma scan by Columbus Testing Laboratory, Inc.

6. 10 CFR Part 21:

Upon arrival at EL, the NRC inspectors established that only Section 206 and Part 21 had been posted. When informed of 10 CFR Part 21.21(a), EL took immediate steps to write and post a procedure, REP-100. The present procedure fails to address responsibilities for evaluating deviations. One violation was identified (see paragraph A).

ORGANIZATION: EBASCO SERVICES, INC.
NEW YORK, NEW YORK

REPORT NO: 99900505/82-03	INSPECTION DATE(S): 8/17-20/82	INSPECTION ON-SITE HOURS: 27

CORRESPONDENCE ADDRESS: Ebasco Services, Inc.
ATTN: B. E. Tenzer, Vice President
Materials Engineering and Quality Assurance
Two World Trade Center
New York, New York 10048

ORGANIZATIONAL CONTACT: B. R. Mazo, Chief, Quality Assurance Engineer
TELEPHONE NUMBER: (212) 839-2830

PRINCIPAL PRODUCT: Architect Engineering Services

NUCLEAR INDUSTRY ACTIVITY: The total effort committed to domestic nuclear activities is approximately 50% of a 5,000 person staff. Major projects include Shearon Harris, Units 1 and 2; St. Lucie, Unit 2; Waterford, Unit 3; and WPPSS, Unit 3. There are also modification/repair service contracts on 10 additional reactor units.

ASSIGNED INSPECTOR: J. R. Costello — 9/17/82
J. R. Costello, Reactor Systems Section (RSS) — Date

OTHER INSPECTOR(S):

APPROVED BY: J. R. Costello for C. J. Hale — 9/30/82
C. J. Hale, Chief, RSS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B, and Topical Report No. ETR-1001

B. SCOPE: This inspection was made as a result of: (1) an allegation concerning unqualified personnel being used in Ebasco's civil engineering organization; (2) a 10 CFR Part 50.55(e) report covering the main/emergency feedwater system of Waterford, Unit 3; and (3) a potential 10 CFR Part 50.55(e)/10 CFR Part 21 report covering the Westinghouse/Ebasco design interface for the Shearon Harris nuclear plants.

PLANT SITE APPLICABILITY:

The contents of this report relate to the following Docket Nos.: 50-382, 50-400, and 50-401.

ORGANIZATION: EBASCO SERVICES, INC.
NEW YORK, NEW YORK

REPORT NO: 99900505/82-03	INSPECTION RESULTS:	PAGE 2 of 5

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

The actions taken by Ebasco relative to the following items were not inspected during this inspection; and, therefore, they will remain open until a future inspection.

1. (Open) Nonconformance (82-02): The control of as-built drawing revisions was not handled by the Waterford No. 3 Drawing Closeout Schedule as evidenced by the fact that the March 31, 1982, issue of the schedule did not show Design Change Notification DCN-MP-589 as outstanding against design drawing LOU-1564-G-195.

2. (Open) Unresolved Item (82-02): Certain safe shutdown analysis may not meet regulatory requirements in that they do not appear to be sufficiently detailed with respect to design assumptions, bases, sources of inputs, reference to plant physical arrangement drawings, analytical models, change control, and interpretation of results.

E. OTHER FINDINGS OR COMMENTS:

1. Allegation - An undated letter was received from an Ebasco employee which stated: (1) the Division Chief of the Ebasco Civil Engineering Design and Drafting Department at the Jericho, New York, facility had no formal engineering education in this country in civil and nuclear engineering; (2) he did not have a Professional Engineer License; and (3) two other members of the Division Chief's staff, a lead engineer and a principal engineer, were not qualified as professional engineers. Concern was expressed that if the Division Chief, the key man who directs the engineering and design of power plants, and his staff are not qualified, there is a definite danger involved in the safety of the plant.

The inspector reviewed the personnel records of the three individuals named in the allegation. The personnel records showed that all three individuals had Bachelor Degrees in civil or architectural engineering from foreign universities in 1953, 1958, and 1960. Two of the individuals had Master Degrees in civil engineering and the Division Chief had an MBA in business. There was no evidence in the personnel files that these degrees had been verified by Ebasco before or since their employment; however, the Division Chief had 28 years of engineering experience, 18 years of which was with Ebasco. The other individuals had engineering experience of 21 years, 9 years of which was with Ebasco, and 22 years, 12 years of which was with Ebasco. None of the individuals were registered as professional engineers.

None of the job requirements for the positions held by these individuals require professional engineering registration. The Design and Drafting Department is not the key function in design, as all of their work is reviewed and approved by the lead civil engineer, and any design document that must be sealed is reviewed and approved by a registered professional engineer. With these individuals' length of work experience and the subsequent review of their work by others, the inspector does not consider this a safety matter of any consequence, and considers this item closed.

2. Potential 10 CFR Part 50.55(e)/10 CFR Part 21 Report - A concern developed that communication between Ebasco and Westinghouse on design changes had not been fully effective and could affect design work. Preliminary investigations indicated that differences might exist between the Ebasco design inputs used by Westinghouse in their original calculations and the current Ebasco designs which have undergone changes.

   As a result of this concern, Carolina Power & Light Company notified Region II of the NRC on May 21, 1981, that this concern was potentially reportable under 10 CFR Part 50.55(e) and 10 CFR Part 21.

   In order to determine the extent of this problem, improve the method of communicating changes, reconcile any potential mismatch, and assure coordination of future design changes, the following steps were taken by Westinghouse and Ebasco:

   a. Westinghouse generated a list of Ebasco documents used in their design/analysis efforts. This list was reviewed by Ebasco.

ORGANIZATION: EBASCO SERVICES, INC.
NEW YORK, NEW YORK

REPORT NO.: 99900505/82-03	INSPECTION RESULTS:	PAGE 4 of 5

b. Ebasco generated a list of Westinghouse documents in conjunction with those documents identified on the Ebasco Manufacturing Drawing Review and Control (EMDRAC) list which were used for design. This list was reviewed by Westinghouse.

c. Ebasco generated a list of Ebasco drawings used by Westinghouse for design/analysis.

d. Ebasco assisted Westinghouse in identifying changes in previous drawing revisions by providing Westinghouse with all available Design Change Notices (DCN).

e. Ebasco changed their procedures and will identify changes in future revisions of interface drawings by providing Westinghouse with a copy of applicable DCN's.

f. As work progresses, Westinghouse provides a listing of Ebasco inputs used in Westinghouse design for Ebasco's review and confirmation.

A reanalysis was completed of the DCN's which described system-related piping changes that could impact proof-of-design calculations. With one minor exception which was not safety-related, this reanalysis concluded that the DCN's which were reviewed had no significant impact on system performance. As a result, Carolina Power & Light has now concluded that this potential deficiency was not reportable.

The resultant upgrading of the EMDRAC system now assures that Westinghouse will be notified on any DCN that affects an interface document as soon as it is written, rather than waiting until it is incorporated into the interface drawing.

The inspector reviewed the generic aspects of this problem and found that the conditions of the Westinghouse/Ebasco design interface which pertained to the Carolina Power & Light Company/ Shearon Harris project did not pertain to the Combustion Engineering/Ebasco design interface that affects the other Ebasco projects. The Combustion Engineering/Ebasco design interface requires that any proposed design change to an interface document be approved by Combustion Engineering before it is approved by Ebasco.

No nonconformances or unresolved items were identified in this area of inspection.

ORGANIZATION: EBASCO SERVICES, INC.
NEW YORK, NEW YORK

REPORT NO.: 99900505/82-03	INSPECTION RESULTS:	PAGE 5 of 5

3. 10 CFR Part 50.55(e) Report - Louisiana Power & Light Company notified Region IV of a potential design deficiency regarding the ability of the plant protection system to detect and respond adequately to a break in the feedwater system piping inside containment.

Ebasco identified the problem when they were making changes to the Emergency Feedwater Instrumentation. A review of the Main and Emergency Feedwater System revealed that if a pipe break occurs in the feedwater line inside containment (between the containment penetration and either check valve 2FW-V825A or 2FW-V826B), the Emergency Feedwater System may not perform as intended.

To assure that the Emergency Feedwater System will perform as intended, it was proposed that the intervals of check valves 2FW-V825A and 2FW-V826B be removed. This action would enable the steam generator instrumentation to detect and respond to a feedwater break anywhere inside containment. However, upon an Emergency Feedwater Actuation Signal, these modifications could result in the loss of inventory from the intact steam generator through the break via a cross-connection in the Emergency Feedwater System. To alleviate this, a check valve will be added downstream of each emergency feedwater flow transmitter. This action will be completed and a final report issued to Region IV by September 30, 1982.

In reviewing the sequence of events that led to this modification, specific problems in the design process could not be identified. The valves were installed approximately 9 years ago and at that time the only line break analyses considered inside containment were at the nozzles of the steam generator. Further, the feedwater line could classify as a super pipe in which case no action would be required.

No nonconformances or unresolved items were identified in this area of inspection.

ORGANIZATION: EXXON NUCLEAR COMPANY
NUCLEAR FUELS DEPARTMENT
RICHLAND, WASHINGTON

REPORT NO.: 99900081/82-01	INSPECTION DATE(S) 9/20-23/82	INSPECTION ON-SITE HOURS: 50

CORRESPONDENCE ADDRESS: Exxon Nuclear Company
Nuclear Fuels Department
ATTN: Mr. C. J. Volmer, Quality Assurance Manager
2955 George Washington Way
Richland, Washington 99352

ORGANIZATIONAL CONTACT: Mr. C. J. Volmer, Quality Assurance Manager
TELEPHONE NUMBER: (509) 375-8257

PRINCIPAL PRODUCT: Nuclear Fuel Assemblies

NUCLEAR INDUSTRY ACTIVITY: Nuclear Fuel Reload supplier for various designed cores.

ASSIGNED INSPECTOR: W. M. McNeill — 10/21/82
W. M. McNeill, Reactive & Component Program Section (R&CPS) — Date

OTHER INSPECTOR(S): J. Hamilton, R&CPS

APPROVED BY: I. Barnes — 10/22/82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: Exxon Topical Report XN-NF-1A, Revision 4.

B. SCOPE: Nonconformances and corrective actions; enrichment and impurity controls; moisture and hydrogen controls; records; document controls; and status of previous inspection findings.

PLANT SITE APPLICABILITY:

Not identified.

ORGANIZATION: EXXON NUCLEAR COMPANY
NUCLEAR FUELS DEPARTMENT
RICHLAND, WASHINGTON

REPORT NO.: 99900081/82-01	INSPECTION RESULTS:	PAGE 2 of 5

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 7.0 of the Topical Report, component vendor quality assurance program effectiveness was not fully assured in the area of Inspection and Test Plans, as evidenced by the following examples:

   a. Revision 6 of an Inspection and Test Plan identified to be used on a purchase order (R-010645) by a fuel clad vendor was not consistent with purchase order requirements, in that it failed to identify the required CSR testing.

   b. Although Exxon had approved Revision 7 of this Inspection and Test Plan, not all of the agreed to changes in respect to Revision 6 were incorporated.

   c. An Inspection and Test Plan submitted by a poison pellet supplier and approved by Exxon allowed a deviation from the product specification in regard to pellet perpendicularity and length sampling.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 15.0 of the Topical Report, nonconforming items were not always controlled in accordance with written procedures, as evidenced by the following examples:

   a. QA Procedure 15, paragraph 3.4.1, requires suspected material to be segregated and tagged. A bin (No. 550) was observed in the pellet storage area which contained two trays of pellets that had become oxidized after release. This bin was not identified with a red hold tag.

   b. QC Procedure XN-NF-P69072, paragraph 4.1.2, requires deviating rods to be identified with a red hold tag. A review of bin 13 found that the bin was tagged, but the bin contained acceptable material. Further examination found that the tag in question should have been applied to bin 12 which contained the referenced nonconforming rods.

c. Approval of a Variance Report (VR 1798) was not in accordance with paragraph 3.5.7 of QA Procedure 15, in that only two of the required three signoffs had been obtained.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 3.1 of QA Procedure 17, certain managers were not transmitting records to the custodian in accordance with requirements, as evidenced by the following examples:

a. Quality Assurance Audit Reports are required to be transmitted yearly, but only 1974 through 1978 reports were on file.

b. Quality Assurance Management Reviews, Procurement and Logistics Approved Vendor Lists, and Instrument Repetitive Maintenance records are required to be transmitted yearly, but, in fact, there were not any on file.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Nonconformance (81-02): No evidence could be found of what specific process outlines and inspection plans by number and revision were applicable to current purchase orders for fuel clad.

Exxon has transmittal letters on file which identify the specific identification and revision of outlines and plans to be used on a given purchase order. In review of this corrective action, nonconformance B.1 was identified.

2. (Closed) Nonconformance (81-02): No evidence could be found of the approval of a revised quality manual of a clad supplier and there was no evidence that the inspection planning in the area of Contractile Strain Ratio testing had been reviewed and approved.

QA Procedure 7, "Procurement Control," has been revised to incorporate the use of Document Transmittal and Routing Forms. As a result, there now is a system to control vendor submittals. The Inspection and Test Plans are being submitted and approved. QA Manuals and their changes are also required to be submitted and approved by Exxon before their use by a vendor.

3. (Closed) Nonconformance (81-02): Material was received and given full release, although the supplier's testing was incomplete.

   The Product Specification will be revised and the QC Standard on receiving inspection has been revised to allow an alternate method of release of cladding. CSR testing for release will be performed by Exxon and the sampling will be on a lot basis rather than a purchase order.

E. OTHER FINDINGS OR COMMENTS:

1. Nonconformances and Corrective Actions - The programmatic requirements were reviewed as identified in QA and QC procedures. The pellet processing, rod processing, and component processing areas of the shop were inspected for implementation of the procedures. The identification, documentation, and disposition of nonconforming material were reviewed. Repair and rework activities were reviewed on rods and components. Trend analyses were found, as well as a preventive action system.

   Nonconformance B.2 was identified in this area. It was also noted that the QA and QC procedures appeared out-of-date and in need of revision, in that the QA procedure referenced activities in paragraph 3.7 on trends and followup to be performed by QA; but, in fact, QC was performing the activities. The QC procedure referenced forms no longer in use. Exxon supervision identified that oxidized pellets are not nonconforming material, but only suspect. Exxon management noted that the VR in question cross-referenced another VR which was fully approved; however, it was noted that the QA Procedure 15 did not provide for use of previously approved VR's on a specific subject, as a basis for modifying approval requirements on subsequent VR's.

2. Enrichment and Impurities Controls - The controls of poison pellet manufacture for both in-house and subvended pellets were inspected. The records and documentation of inspections, sampling plans, and administrative controls were reviewed. Analytic chemistry reports were inspected and in-house sampling and inspection were observed. Product and process requirements were found to be verified for lots 245-7P and 245-6P, which were manufactured in-house, and lot 2746, which was subvended.

3. Moisture and Hydrogen Controls - The controls of poison pellet manufacture, which were performed for in-house and subvended pellets, were inspected. The records, sampling plans were verified. The

drying/outgassing operation was observed for lot 245-6P manufactured in-house. Similar records for lot 2746 (subvended pellets) were also inspected.

4. Records - A sample of four types of Quality Assurance Records were reviewed. These were Management and Administrative, Engineering, Procurement, and Manufacturing/Inspection. In this area, nonconformance B.3 was identified.

   It was observed that engineering records were only recently being transmitted to the record custodian. This nonconformance was detected during an internal audit in early 1982. Corrective action was identified in a memorandum of March 19, 1982. A schedule to collect and microfilm these records was established and was being adhered to at the time of this inspection.

   Table I of Procedure 17, "Quality Assurance Records," which identifies the records and schedule for transmittal to the custodian was found to be misleading. For example, Test Reports and Nonconforming Material Reports were listed as separate documents for transmittal to the custodian, but were, in fact, a part of QC Release Files which were being separately transmitted to records. Process Technical Analysis Flow Sheets for Reactor Physics, Stress, Thermal-Hydraulics, and Accident Analysis were also shown to be separately transmitted to records, but were, in fact, a part of the Design and Safety Analysis Calculations being transmitted as one entity to records. Seven other types of documents were incorrectly shown to be transmitted to the records custodian after release or issue, but were, however, actually issued by the custodian.

5. Document Control - Documents were reviewed in component preparation, spacer cage fabrication, and rod fabrication areas in the shop. Thirty-six QC Standards and Process Specifications were reviewed and compared to operations and inspections being performed throughout the three areas. It was observed in the fuel rod fabrication area, that only Revision 8 of XN-NF-P20,222, a Process Specification for rework of fuel rods was available. The DRESDEN No. 2 fuel rods being processed at that time required Revision 7 of XN-NF-P20,222. Further inspection established that Revision 7 had been distributed by document control to the appropriate supervisor, but it had not been further distributed to work stations at the time of this inspection. It was observed in the spacer cage assembly area that Revision 0 of XN-NF-P68432, a Quality Control Standard for guide tube assembly and inspection, was available when, in fact, Revision 1 was the latest standard distributed to this area. XN-NF-P68432, Revision 1 is shown as being required for use on Maine Yankee; however, Maine Yankee was not being processed.

ORGANIZATION: THE FOXBORO COMPANY
NEPONSET PLANT
FOXBORO, MASSACHUSETTS

REPORT NO.: 99900788/82-01	INSPECTION DATE(S) 9/14-16/82	INSPECTION ON-SITE HOURS: 24

CORRESPONDENCE ADDRESS: The Foxboro Company
ATTN: Mr. Forest Leathers
Corporate QA Manager-Field Operations
38 Neponset Avenue
Foxboro, MA 02035

ORGANIZATIONAL CONTACT: Mr. Forest Leathers, Corporate QA Mgr.-Field Operations
TELEPHONE NUMBER: (617) 543-8750

PRINCIPAL PRODUCT: Differential Pressure Transmitters, Recorders, and Indicating Instruments

NUCLEAR INDUSTRY ACTIVITY: Approximately 1-2% based on sales

ASSIGNED INSPECTOR: J. Barnes for R. E. Oller, Reactive & Component Program Section (R&CPS) — Date: 10-21-82

OTHER INSPECTOR(S):

APPROVED BY: J. Barnes — I. Barnes, Chief, R&CPS — Date: 10-21-82

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and 10 CFR Part 21.

B. SCOPE: Status of previous inspection findings; manufacturing process control; nonconformances and corrective action; internal audits; and equipment calibration.

PLANT SITE APPLICABILITY:

Not identified.

ORGANIZATION: THE FOXBORO COMPANY
NEPONSET PLANT
FOXBORO, MASSACHUSETTS

REPORT NO.: 99900788/82-01	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS

1. (Closed) Violation (99900297/81-01): Failure by Foxboro Company to post a notice which contained the current name of the individual to whom reports may be made, as required by paragraph 21.6 of 10 CFR Part 21.

   The NRC inspector verified that in accordance with Foxboro's response letter dated February 3, 1982, the notice was revised on November 18, 1981, to identify the person responsible for receiving deficiency reports, and was posted on all official company bulletin boards.

2. (Open) Nonconformance (99900297/81-01): Failure by Foxboro-Jordan, Inc., a subsidiary of the Foxboro Company, to report to the Foxboro Nuclear Safety Subcommittee a problem concerning heat damage to geared limit switch housings in Electrodyne valve motor operators installed in Sequoyah Unit 2, as required by the Foxboro Corporate QA Procedure 3.1.8.2, Revision A.

   In the Foxboro response letter dated February 3, 1982, to the NRC, Foxboro indicated that extensive review of records could not substantiate that any notification of the problem was made by Tennessee Valley Authority to Foxboro-Jordan, therefore, Foxboro believed that there had been no nonconformance to Foxboro procedures relating to the TVA 10 CFR Part 50.55(e) report on the problem.

   This item will be reviewed at a future inspection, after receipt of additional information from TVA.

ORGANIZATION: THE FOXBORO COMPANY
NEPONSET PLANT
FOXBORO, MASSACHUSETTS

REPORT NO.: 99900788/82-01	INSPECTION RESULTS:	PAGE 3 of 4

E. OTHER FINDINGS OR COMMENTS:

1. Manufacturing Process Control: The NRC inspector reviewed nine sections of the Foxboro, Neponset Plant QA Manual, which were applicable to manufacture of differential pressure transmitters.

   Observations were made of inprocess assembly and inspection of parts and subassemblies of force motors for d.p. transmitters, and of final inspections and tests, including the calibration, of a Nuclear Force Balance Transmitter, Model NE13DM, Style B.

   To verify that d.p. transmitters for nuclear service are manufactured, inspected, tested, and the results are documented in accordance with requirements, a review was made of: a final assembly schedule and manufacturing specification for collection of force motor parts; a subassembly schedule for four types of force motors; documents consisting of a subassembly schedule, worksheet, and procedure drawing for assembly of terminal blocks; documents consisting of worksheets, quality checklists, a QC instruction, an assembly drawing controlling final assembly and inspection of force motors; documents in the final inspection package for d.p. transmitters, Part No. NE-13DH, Style B, consisting of a motor specification instruction and an information sheet; ten test, inspection and certification records, in a sales order package, for a completed transmitter of the same part number as previously identified; quality checklists and inspection drawings for a detector assembly, Part No. N0138MX, and a terminal box, Part No. N0148SL, for a force motor; parts manufacturing documents consisting of shop travel cards, factory order parts lists, assembly worksheets, and production drawings for a rectifier, Part No. D0118BK, and a bourdon tube subassembly.

   Within this area, no nonconformances or unresolved items, with respect to NRC and QA program requirements, were identified.

2. Nonconformances and Corrective Action: The inspector reviewed Sections XV and XVI of the Neponset Plant QA Manual, which were applicable to identification, disposition, and corrective action for deficiencies found in d.p. transmitter materials and the finished product.

   Observations were made of tagged nonconforming parts.

   To verify that nonconforming items are reviewed and accepted, rejected, repaired or reworked, and that conditions adverse to quality, including the cause, are promptly identified and corrected, a review was made of:

5 procedures; 6 nonconformance reports for material and finished products; 3 nonconformance reports, short forms for visual discrepancies in finished products; 10 nonconformance reports, long form for functional discrepancies in finished products; the August 1982 monthly report for finished products; and the August 1982 monthly report for materials.

Within this area, no nonconformances or unresolved items, with respect to NRC and the QA program requirements, were identified.

3. Internal Audits: The inspector reviewed Section XVIII of the Foxboro, Neponset Plant QA Manual, which was applicable to internal audits.

The inspector also reviewed four QC operating instructions, a QC worksheet instruction, a Neponset operating guide, the QC audit schedule for 1982, and 1981 and 1982 audit records pertaining to seven types of audits identified in the audit schedule. This review was made in order to verify that: (a) planned periodic audits of all aspects of the QA program are performed in accordance with written procedures or checklists by qualified personnel; (b) the results are documented and reviewed by management; and (c) followup action is taken where indicated.

Within this area, no nonconformances or unresolved items, with respect to NRC and the QA program requirements, were identified.

4. Equipment Calibration: The inspector reviewed Section XII of the Foxboro, Neponset Plant QA Manual, which was applicable to calibration, and observed the calibration status of numerous measuring and testing devices located in five inspection and test areas.

To verify that the above observed devices, used in activities affecting quality are controlled and calibrated on a scheduled basis, and the results are documented in accordance with written procedures, a review was made of: three QC operating instructions governing control of measuring equipment, care, and followup on equipment calibration discrepancies; a QC instruction delineating calibration methods for each type of device; a 1982 calibration schedule; a 1982 record of unavailable tools and gages; a master list of devices under the calibration program; and calibration record history cards for 30 measuring and testing devices.

Within this area, no nonconformances or unresolved items, with respect to NRC and the QA program requirements, were identified.

ORGANIZATION: GENERAL ELECTRIC COMPANY
WILMINGTON MANUFACTURING DEPARTMENT
WILMINGTON, NORTH CAROLINA

REPORT NO.: 99900003/82-02	INSPECTION DATE(S) 8/24-27/82	INSPECTION ON-SITE HOURS: 28

CORRESPONDENCE ADDRESS: General Electric Company
Wilmington Manufacturing Department
ATTN: Mr. J. A. Long, General Manager
P. O. Box 780
Wilmington, NC 28401

ORGANIZATIONAL CONTACT: Mr. C. W. Doyle, Quality Audits & Customer Service Mgr.
TELEPHONE NUMBER: (919) 343-5884

PRINCIPAL PRODUCT: Nuclear Fuel Assemblies and Core Hardware.

NUCLEAR INDUSTRY ACTIVITY: Major nuclear fuel, control rod drives, jet pumps, steam separators, hydraulic control units, and other BWR core hardware for GE designed cores.

ASSIGNED INSPECTOR: I. Barnes for W. M. McNeill, Reactive & Component Program Section (R&CPS) — Date: 10-5-82

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes, Chief, R&CPS — Date: 10-5-82

INSPECTION BASES AND SCOPE:

A. BASES: General Electric Topical Report NEDO-11209-04

B. SCOPE: Control of special processes, manufacturing process control, calibration, and status of previous inspection findings.

PLANT SITE APPLICABILITY:

Not identified.

ORGANIZATION: GENERAL ELECTRIC COMPANY
WILMINGTON MANUFACTURING DEPARTMENT
WILMINGTON, NORTH CAROLINA

REPORT NO.: 99900003/82-02	INSPECTION RESULTS:	PAGE 2 OF 4

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Section 5 of the Topical Report and the Quality Assurance Program, NEDE-20586, Section 6.7.5.1, verification of all Purchase Order requirements was not perfomed, in that Anhydrous Ammonia was received and accepted five times since 1978, although the vendor failed to comply with the purchase specification D27A1 requirement for reporting of noncondensable gases.

2. Contrary to Section 5 of the Topical Report and the Quality Assurance Program, NEDE-20586, Section 6.7.5, purchased bulk chemicals, such as gases, are not always examined upon delivery. A lot of 34,720 pounds of Anhydrous Ammonia (PO 334Z2832) was received on August 13, 1982, and used from that date on, without a verification of the quality. The supplier certification and test results were inadvertently attached to a receiver for another purchase order and a release had not been issued.

3. Contrary to Section 5 of the Topical Report and the Quality Assurance Program, NEDE-20586, Section 6.12.3, it was observed that the hardness tester (W02182) was calibrated during 1982 at an interval of 6 months and not at the prescribed 3-month interval.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

(Closed) Nonconformance 82-01: There was no Quality Notice or other data to document the temperature profile verification in 1981 for four of five autoclaves. In addition, there was no Quality Notice, but there were data to document that temperature profiles were verified for three of the autoclaves in 1980. Quality Notices have been issued to document the current qualifications of the autoclaves.

E. OTHER FINDINGS OR COMMENTS:

1. Control of Special Processes - The special process of nitriding stainless steel was inspected. The process specification, qualification reports, inspection plan, and process procedures were reviewed in detail. The nitriding process was inspected; in particular, the records of lot 371 for collet pistons and guide caps. It was verified that the process conformed to specification

ORGANIZATION: GENERAL ELECTRIC COMPANY
WILMINGTON MANUFACTURING DEPARTMENT
WILMINGTON, NORTH CAROLINA

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and qualification limits and requirements, except as noted below. Anhydrous Ammonia is used in the nitriding process. The process specification requires use of ammonia bought to purchase specification D247A1 Grade C1.

This specification requires the manufacturer to report noncondensable gases. The vendor never supplied this particular report. The Receiving Inspection unit had issued a Purchase Order Deficiency Notice (PODN) 3994; however, the Purchase Material Quality Control Engineer had deleted this item from the PODN. This problem has been identified as nonconformance B.1. GE issued an Inspection Report to document this nonconforming material on the subject shipments during this inspection. The most recent shipment of Anhydrous Ammonia was observed to be in use, but no release of the material had been issued. As gases are received the certifications, test reports, etc., are passed on to Receiving Inspection; however, procedural controls do not exist which would preclude use of bulk chemicals prior to release by Receiving Inspection. This problem is identified as nonconformance B.2.

2. Manufacturing Process Control - The control of manufacturing by shop traveler and procedures was verified. The use of the latest revisions of procedures and drawings was verified. Conformance to instructions and signoff of traveler's steps were verified with some exceptions noted below. GE has implemented a new computerized shop traveler/procedure system called the MI Plan. A lot of reducing tees were observed with step 20 signed off; however, the marking requirements identified in the MI Plan for step 20, but not on the engineering drawing identified on the traveler, were not complete. These tees were at inspection where the Quality Control Inspection Instruction did not identify an inspection of the marking. The marking requirements are inprocess information for subsequent assembly. The necessary revisions of the Practices and Procedures have yet to be issued that describe the use of the MI Plan. Compliance of ASME code parts, in regard to NCA-4134.9(b) and 4134.10(b) requirements for inclusion of document numbers and their revisions, will be subject to followup during the next inspection. The MI Plan system will be reinspected after issue of the Practices and Procedures. In regard to the subject reducing tees, manufacturing did mark the parts correctly and Quality Control did revise its procedure before the end of this inspection.

3. Calibration - A sample of 17 gages and instruments was inspected. The conformance to established calibration procedures, frequencies, acceptance limits, records, and labelling was verified with the exceptions noted below. It was noted that the basic procedure which cross referenced the calibration procedure to be used, contained a

ORGANIZATION: GENERAL ELECTRIC COMPANY
WILMINGTON MANUFACTURING DEPARTMENT
WILMINGTON, NORTH CAROLINA

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number of errors; e.g., Vernier Caliper (Dial) referenced Gage Inspection Standard B.23 instead of B.13, and Micrometers, Depth referenced B.01 instead of B.03. Unrelated to this problem, the frequencies referenced in the basic procedure were not followed in two cases. A spring compression tester was found being calibrated at a 3-month interval and not a 6-month interval; and a hardness tester was found being calibrated at a 6-month interval and not 3-month interval. This is identified as nonconformance B.3.

ORGANIZATION: GENERAL ELECTRIC COMPANY
POWER SYSTEMS MANAGEMENT BUSINESS DEPARTMENT
ANASCO, RIO PIEDRAS AND VIEQUES ISLAND, PUERTO RICO

REPORT NO.: 99900352/82-01	INSPECTION DATE(S) 9/20-24/82	INSPECTION ON-SITE HOURS: 37

CORRESPONDENCE ADDRESS: General Electric Company
Power Systems Management Business Department
ATTN: Mr. E. Fierko - General Manager
205 Great Valley Parkway
Malvern, Pennsylvania 19355-0715

ORGANIZATIONAL CONTACT: Mr. C. Scott, Manager, Quality Systems
TELEPHONE NUMBER: (215) 251-7083

PRINCIPAL PRODUCT: Electrical Relays and Switches, Type 1E.

NUCLEAR INDUSTRY ACTIVITY: Commercial Nuclear Production at the three manufacturing locations in Puerto Rico totals 3% of production.

ASSIGNED INSPECTOR: J. W. Sutton — 11-7-82
J. W. Sutton, Reactive & Component Program Section (R&CPS) — Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes — 11-10-82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and 10 CFR Part 21.

B. SCOPE: This inspection was performed to review the status of previous inspection findings, QA program/organization, nonconformance/corrective action, calibration and inspection.

PLANT SITE APPLICABILITY:

Not identified.

ORGANIZATION: GENERAL ELECTRIC COMPANY
POWER SYSTEMS MANAGEMENT BUSINESS DEPARTMENT
ANASCO, RIO PIEDRAS AND VIEQUES ISLAND, PUERTO RICO

REPORT NO.: 99900352/82-01	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Violation (81-01) - Implementation of 10 CFR Part 21-Posting: The NRC inspector reviewed the corrective action taken by General Electric Company, Power Systems Management Business Department (GEPSMBD) as indicated in their reply to the NRC dated September 8, 1981.

   The NRC inspector verified that current copies of 10 CFR Part 21 were in all plant managers' files. In addition, the NRC inspector verified by review of bulletin boards at each of the manufacturing locations that the posting requirements of 10 CFR Part 21 had been accomplished.

2. (Closed) Nonconformance (81-01) - Change Control: The Quality Assurance inspector (Receiving) had not verified drawings against the Engineering Drawing Master List (EDML) prior to use of the drawing for acceptance of parts.

   The NRC inspector verified by observation and review of the current EDML issued September 11, 1982, that the inspector (Receiving) now verifies that the drawing being used for Product Acceptance is the current issue. This item was reviewed at the Rio Piedras and Anasco locations.

3. (Resolved) Unresolved Item (81-01) - Change Control: The Product Engineering Operations Manual did not contain all items identified in its Table of Contents or identify how a written procedure for alteration notices should be distributed.

The NRC inspector reviewed the current Project Engineering Manual (PEM) to determine if procedures existed for all items as listed in the Table of Contents. The PEM has been completely revised and reedited from the original edition. The new PEM contains Sections for Organization, Product Engineering Procedures, and Product Engineering Forms. Commitments made to the NRC have been fulfilled.

E. OTHER FINDINGS OR COMMENTS

1. QA Program/Organization: The NRC inspector reviewed the current GEPSMBD QA Manual, Section I, "Organization," and Section II, "QA Program," issued March 11, 1982. The NRC inspector reviewed the organizational charts for the three manufacturing locations for compliance with 10 CFR Part 50, Appendix B requirements. In addition, the job descriptions for all Quality Assurance personnel were reviewed and discussed with NRC inspector designated QA personnel. As a result of this review and discussions, the NRC inspector determined that the requirements of 10 CFR Part 50, Appendix B are being implemented.

2. Nonconformance/Corrective Action: The NRC inspector reviewed GEPSMBD's QA Manual, Section 15, "Nonconforming Material, Parts or Components," and Section 16, "Corrective Action," issued March 11, 1982. In addition, procedures for risk defect reporting were reviewed for content. The NRC inspector reviewed 12 nonconformance reports issued at Anasco and Rio Piedras, the open and closed nonconformance log book, material review board meeting reports, and associated documents. These records were reviewed to determine compliance to QA program requirements. The corrective action taken to prevent recurrence was examined for implementation. Areas designated for segregation of nonconforming items at each location were inspected. Relative to the documents examined, the NRC inspector determined that activities were in conformance with the QA program requirements.

3. Calibration: The NRC inspector reviewed GEPSMBD's QA Manual, Section 12, "Control of Test and Measuring Equipment." Thirty-five final acceptance gages, meters and measurement equipment, including calibration standards, were examined for compliance to QA program requirements. The controlling computer runs and calibration card systems used at each location were reviewed for content. Procedures, records, and associated documentation were checked for compliance to QA/QC requirements. All equipment examined was found to be in compliance with QA/QC requirements. As a result of the review of this

documentation, the NRC inspector determined that calibration requirements are being implemented in accordance with QA Manual commitments.

4. Inspection: The NRC inspector reviewed GEPSMBD's QA Manual, Section 10, "Inspection," for QA/QC requirements. The NRC inspector examined 10 product reports, data sheets, inspection reports of products, and inprocess audits of inspection activities. In addition, six shop orders were reviewed at each location for compliance with the current drawing control. Inspectors' qualification records and control of inspectors' stamps and signatures were examined, and a review made of inspection control books and supervisors' activities. As a result of the review of documentation and work practices, the NRC inspector determined that inspection activities were being controlled in accordance with QA Manual commitments.

ORGANIZATION: GEORGIA INSTITUTE OF TECHNOLOGY
ATLANTA, GEORGIA

REPORT NO.: 99900903/82-01	INSPECTION DATE(S) 8/31-9/1 & 10/25-26/82	INSPECTION ON-SITE HOURS: 28

CORRESPONDENCE ADDRESS: Georgia Institute of Technology
Nuclear Research Center
ATTN: Mr. J. Russell, Director
900 Atlantic Drive, N.W.
Atlanta, GA 30322

ORGANIZATIONAL CONTACT: Mr. T. F. Craft, Ph.D.
TELEPHONE NUMBER: (404) 894-3600

PRINCIPAL PRODUCT: Radiation Testing

NUCLEAR INDUSTRY ACTIVITY: Georgia Institute of Technology (GIT) is actively engaged in conducting radiation testing of components for nuclear power generating plant applications. The service is provided to both utility and manufacturing companies.

ASSIGNED INSPECTOR: A. L. Smith, Equipment Qualification Section (EQS) Date 11/30/82

OTHER INSPECTOR(S): H. S. Phillips, EQS

APPROVED BY: H. S. Phillips, Chief, EQS Date 11-30-82

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection consisted of: (1) initial management meeting, (2) review of test facility capabilities, (3) determination of Class 1E equipment qualification effort, (4) review and evaluation of the quality assurance program, and (5) witness radiation testing of NAMCO limit switches.

PLANT SITE APPLICABILITY:

Not applicable in this case.

ORGANIZATION: GEORGIA INSTITUTE OF TECHNOLOGY
ATLANTA, GEORGIA

REPORT NO.: 99900903/82-01	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCES:

Contrary to Criterion V of Appendix B to 10 CFR Part 50 and the requirements placed upon Georgia Tech by Wyle Laboratories Purchase Orders 4-5658-S, 4-5628-S, 4-5724-S, 4-5829-S, 4-5830-S, 4-6643-S, 4-6781-S, and Corporate Consulting and Development Company Ltd. Purchase Orders 1353, 1357, and 1433, GIT had not established or implemented a quality assurance program described by documented instructions or procedures.

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS AND COMMENTS:

1. Management Meeting - The NRC inspection team made a presentation to GIT management personnel to describe and explain the NRC Equipment Qualification Program. The presentation included the NRC and Region IV organizations, bases for inspection, history of the EQ program, and status of proposed rules being developed and in the adoption process. In addition, the format, content, dissemination, and publication of NRC inspection reports were discussed in detail. NRC fact sheets, organization charts, and other handouts were provided to GIT management.

2. Tour of Test Facility - The NRC inspection team toured the test facility to observe the specific test apparatus which was being used to perform environmental qualification testing. At present, GIT has only the capability to perform radiation aging tests.

3. Witness of Test - During the first two days of the inspection, GIT was in the process of performing radiation aging testing on four NAMCO limit switches with Cam-Lock connectors. These limit switches, Nos. EA 740-20100,217; EA 180-11302,216; EA 180-11302,184; and EA 180-11302,185, were in place in the "hot cell." The manufacturer has specified that the four switches are to receive 204 megarads of gamma radiation at a rate of 0.5-1.0 megarads per hour. At the time of the inspection, the test was proceeding as specified.

ORGANIZATION: GEORGIA INSTITUTE OF TECHNOLOGY
ATLANTA, GEORGIA

REPORT NO.: 99900903/82-01	INSPECTION RESULTS:	PAGE 3 of 3

4. Quality Assurance Program - Upon initiation of this portion of the inspection, the NRC inspection team was informed that GIT had not initiated or implemented a formal (documented) quality assurance program to meet the requirements of 10 CFR Part 50, Appendix B or any other regulation and/or specification.

   In an effort to determine what, if any, quality assurance requirements had been imposed upon GIT by its clients, the inspector examined 29 purchase orders from 5 different clients for testing of nuclear safety-related equipment. This review revealed that in a number of instances, the clients' purchase orders imposed the requirements of 10 CFR Part 50, Appendix B and 10 CFR Part 21. The nonconformance discussed in paragraph B above was identified.

5. Implementation of 10 CFR Part 21 - GIT had accomplished posting requirements in accordance with the provisions of 10 CFR Part 21; however, examination of their written procedures revealed that these procedures cover the operation of their experimental reactor, but were vague relative to the radiation testing portion of their "operation." During the discussion of this item with their management personnel, they agreed to revise their written procedures to clearly describe their radiation testing effort.

   This item is considered as an open item and will be followed up by the NRC inspector during the next scheduled inspection.

GANIZATION: GILBERT/COMMONWEALTH
UTILITIES GROUP
READING, PENNSYLVANIA

PORT .: 99900525/82-02	INSPECTION DATE(S) 10/5-8/82	INSPECTION ON-SITE HOURS: 52

RRESPONDENCE ADDRESS: Gilbert/Commonwealth
Utilities Group
ATTN: Mr. H. Lorenz, Group Vice President
Post Office Box 1498
Reading, PA 19603

GANIZATIONAL CONTACT: Mr. N. R. Barker, Vice President, QA
LEPHONE NUMBER: (215) 775-2600

INCIPAL PRODUCT: Architect Engineering and Consulting Services

CLEAR INDUSTRY ACTIVITY: The total effort committed to domestic nuclear tivities at the Reading facility is approximately 34% of the 2700 person staff the Utilities Group. Major projects include Perry, Units 1 and 2; V. C. mmer, Unit 1; Three Mile Island, Unit 1 restart; and continuing services for ystal River, Unit 3; Ginna Station; and Virginia Electric and Power Company.

SIGNED INSPECTOR: P. H. Harrell, Reactor Systems Section (RSS) Date 11/12/82

HER INSPECTOR(S): C. J. Hale, RSS

PROVED BY: C. J. Hale, Chief, RSS Date 11/16/82

SPECTION BASES AND SCOPE:

BASES: 10 CFR Part 50, Appendix B and Topical Report GAI-TR-106.

SCOPE: Status of previous inspection findings and the following: (1) NRC Inspection Report 99900328/81-01 (Brown - Boveri, Tulsa) stating 7kV speed and transfer switches were manufactured for the V. C. Summer Station without required submission of NDE procedures and operator qualifications; (2) TVA (Watts Bar, Units 1 and 2) reported that Gilbert/Commonwealth (G/C) used
(cont. on next page)

ANT SITE APPLICABILITY:

-395 and 50-390/391.

ORGANIZATION: GILBERT/COMMONWEALTH
UTILITIES GROUP
READING, PENNSYLVANIA

REPORT NO.: 99900525/82-02	INSPECTION RESULTS:	PAGE 2 of 6

SCOPE: (Cont.) incorrect design spectra in the analysis of pipe stresses in the Emergency Raw Cooling Water System; and (3) 10 CFR Part 21 report (V. C. Summer Station) stating G/C issued an incomplete Engineering Change Notice for replacement of elastomers in safety-related solenoid valves.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

Contrary to the requirements of Criterion V of Appendix B of 10 CFR 50, procedures/instructions in effect before November 2, 1981, did not assure that all necessary and required information was included in Engineering Change Notice (ECN) 1427-FM issued for the V. C. Summer Plant.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Nonconformance (81-03): Revision XI of specification SP-527-4549-00 does not specifically address the material requirements for the Perry, Units 1 and 2, anchor and barrier plates of containment mechanical piping penetration assemblies as committed in G/C 10 CFR Part 21 report to NRC, dated April 28, 1981.

   Specification SP-527-4549-00 has been revised to include the material requirements for the anchor and barrier plates. An engineering design guide, engineering design bulletin, and internal memo have been issued to all engineering personnel to provide additional clarity for the design of and requirements for containment penetration anchor plates.

2. (Closed) Nonconformance (81-03): Design specifications 597-04-4461-00, 592-04-4461-00, and 527-4549-00 did not include all the design input data required by Section 3.0 of ANSI N45.2.11.

   Specification 597-04-4461-00 has been revised to identify the proper design input. A calculation (SP-13.19) has been performed to verify the sodium hydroxide tank will operate under the new conditions stated

in the specification. G/C has issued a letter to South Carolina Electric and Gas (SCE&G) recommending recertification of the tank. Also, G/C has issued a design bulletin to remind engineering personnel to give proper consideration to tanks operating under vacuum conditions.

Specification 592-04-4461-00 has been revised to include proper operability requirements. A procedure revision and a design bulletin have been issued to clarify use of operability requirements in specifications.

Specification 527-4549-00 has been revised to clarify the requirements for barrier and anchor plates. In addition, the Perry Power Project FSAR has been changed to reflect the design requirements stated in the specification.

3. (Closed) Nonconformance (81-03): A piping system analyst did not identify, nor note on the affected system stress isometric drawing 47K-406-128, that the spatial orientation of the X-axis used in stress calculation 0600165-08-17 was reversed from conventional orientation as required by TVA procedures CEB-SQN-100 and SQN-DC-V-13.3. Further, the checker failed to detect and record the error as required by the Sequoyah Nuclear Power Plant Checking Procedure.

   A memo has been issued to all T-PIPE users to alert them of this problem. G/C management stated that revised procedural instructions were issued to the Oak Ridge office to preclude repetition of the error. The procedures were not available for review at the G/C Reading office; however, an inspection of the G/C Oak Ridge office will be scheduled.

4. (Closed) Nonconformance (81-03): Mechanical Department calculation 13.19, dated June 11, 1981, did not note the specific purpose or objective of the calculation nor did it identify the source(s) of the negative three psi pressure differential and the atmospheric pressure variation that were used as design inputs to the calculation as required by V. C. Summer procedure 4.2.1, section 4.1.4.

   The calculation has been revised to clarify the specific purpose. A memo had been issued to strengthen enforcement of existing procedural requirements.

ORGANIZATION: GILBERT/COMMONWEALTH
UTILITIES GROUP
READING, PENNSYLVANIA

REPORT NO.: 99900525/82-02	INSPECTION RESULTS:	PAGE 4 of 6

5. (Closed) Nonconformance (82-01): A Design Verification Status Report (DVSR) prepared by the Applied Engineering Analysis discipline did not identify and, therefore, did not indicate the status of safety-related calculation 2.7.1.2.

   The DVSR has been revised to include calculation 2.7.1.2. All affected project engineers have verified that their portion of the DVSR is complete, accurate, and up-to-date.

E. OTHER FINDINGS OR COMMENTS:

1. NRC Inspection Report 99900328/81-01 (Brown-Boveri, Tulsa) - This report states that 7kV speed and transfer switches were manufactured by Brown-Boveri for the V. C. Summer Station without submission of the required documents. Specification SP-701-4461-00, Revision 2, dated October 12, 1973, requires the following documents be submitted to G/C or SCE&G for approval at least 6 weeks prior to start of manufacture: (1) NDE procedures; (2) NDE operator qualifications; and (3) seismic calculations or test results.

   Specification SP-701-4461-00 is a quality assurance program requirements generic specification. A copy of SP-701-4461-00 is provided as an attachment to all procurement specifications; in this case, specification SP-613-04-4461-000. The requirements stated in specification SP-701-4461-00 are reviewed by the Quality Assurance Division (QAD) to determine which documents in the generic list are required for submittal for each specific procurement. A Manufacturer's Required Data List (MRDL) is generated as a result of the QAD review and transmitted to the contractor. An MRDL was sent to Gould (presently known as Brown-Boveri) on May 11, 1977. The MRDL did not require Gould to submit NDE procedures or NDE operator qualifications as a requirement to comply with specification SP-613-04-4461-000.

   As noted in a G/C Expediting Report, dated June 13, 1977, documentation for seismic calculations or test results were not available for the switches being procured. The report also states that Gould requested approval to fabricate one switch to be used for seismic testing; approval was given by G/C. On November 23, 1977, a release for fabrication was issued by G/C with the understanding that the seismic test would be performed in parallel with fabrication activities. The seismic test report was submitted by Gould and was approved by G/C on November 23, 1978. The switches were also shipped on that date.

No nonconformances or unresolved items were identified concerning procurement control commitments in the G/C Quality Control Program.

2. TVA 10 CFR 50.55(e) Report, Incorrect Design Spectra by the G/C Oak Ridge Office - The report states that the incorrect response spectra were used at several support locations. The error was discovered by G/C during an analysis review.

   At the time the error was made, G/C Oak Ridge office personnel were working under a services contract with TVA. Within the scope of this contract, the G/C Oak Ridge office personnel worked under TVA direction and under the TVA QA program. Therefore, the design work and verification performed by G/C personnel were controlled by requirements of the TVA QA Program.

   G/C Oak Ridge office personnel have since performed TVA work under G/C direction and under the G/C quality assurance program. Since the G/C Oak Ridge office personnel have been under control of the G/C quality assurance program, internal audits indicate that G/C has performed to the commitments of their quality program.

   No nonconformances or unresolved items were identified. This item is considered closed at G/C.

3. A 10 CFR Part 21 Report (SCE&G) - This report states that G/C issued an ECN that did not contain a complete list of the ASCO solenoid-operated valves in the V. C. Summer Plant that required modification.

   A memo from the G/C Instrumentation & Control (I&C) Section, dated December 18, 1979, requested certain disciplines provide a list of ASCO valves in the V. C. Summer Plant containing ethylene propylene rubber elastomers. The I&C Section was accumulating the list from each discipline to prepare the ECN. The Mechanical/Nuclear Section returned a list providing all the ASCO valves, but the solenoid number for four of the valves was to be provided "later." When the I&C Section received the input, they compiled a composite list of the valves as an attachment to ECN 1427-FM.

   During this compilation, the ECN preparer did not include the four valves which had solenoid numbers listed as "later." ECN 1427-FM was issued and sent to the utility (SCE&G). A subsequent check of the list by SCE&G revealed that four valves were missing and issued a 10 CFR Part 21 report.

ORGANIZATION: GILBERT/COMMONWEALTH
UTILITIES GROUP
READING, PENNSYLVANIA

REPORT NO.: 99900525/82-02	INSPECTION RESULTS:	PAGE 6 of 6

G/C did not maintain a program that assured important activities were satisfactorily accomplished in that no mechanism was established to prevent the ECN from being closed when information (the solenoid number for the four valves) was still required to provide a complete list of the valves. A nonconformance resulted from this area of inspection (see B above).

ORGANIZATION: HARNISCHFEGER CORPORATION
MILWAUKEE, WISCONSIN

REPORT NO.: 99900088/82-01	INSPECTION DATE(S) 10/18-22/82	INSPECTION ON-SITE HOURS: 33

CORRESPONDENCE ADDRESS: Harnischfeger Corporation
ATTN: Mr. Gerald H. Goff
Director, QA
4400 West National Avenue
Milwaukee, WI 53201

ORGANIZATIONAL CONTACT: Mr. Clifford W. Zych, Supervisor - Quality Audits
TELEPHONE NUMBER: (414) 671-4400

PRINCIPAL PRODUCT: Excavators and cranes

NUCLEAR INDUSTRY ACTIVITY: The nuclear product (i.e., cranes and missile shields) was approximately 1% of their 1981 net sales and is approximately 0.1% of their 1982 net sales.

ASSIGNED INSPECTOR: C. J. Hale for — 11/19/82
J. T. Conway, Reactive and Component Program Section (R&CPS) — Date

OTHER INSPECTOR(S):

APPROVED BY: C. J. Hale for — 11/19/82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and 10 CFR Part 21.

B. SCOPE: This inspection was made as a result of the Public Service of Indiana 10 CFR Part 50.55(e) notification of polar cranes at the Marble Hill Nuclear Station having coating defects and weld defects. In addition, the following QA programmatic areas were inspected: training/qualifications; control of special processes; manufacturing process control; inspection; testing; calibration of measuring and test equipment; records; audits; and reporting of defects.

PLANT SITE APPLICABILITY:

Polar cranes (coating defects and weld defects), Docket Nos. 50-546/50-547.

ORGANIZATION: HARNISCHFEGER CORPORATION
MILWAUKEE, WISCONSIN

REPORT NO.: 99900088/82-01	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATIONS:

Contrary to Section 21.6 of 10 CFR Part 21, a notice describing the regulations/procedures was not posted along with the previously posted Section 206.

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 5.4.5 in Section 5 of the QA Manual, a review of testing equipment in the materials engineering laboratory revealed that procedures did not exist for two types of hardness testing equipment; i.e., Tukon Hardness Tester and the Detroit 3000 kgs H.B-2 Brinell Hardness Tester.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraphs 12.5 and 12.6 in Section 12 of the QA Manual, a review of testing equipment in the materials engineering laboratory revealed that the Rockwell Model 3YS Hardness Tester (No. 0754), Tukon Hardness Tester (No. 0623), and Wilson Model 5JR BB Hardness Tester (No. 0755) had exceeded their calibration due date, and there were no calibration records for the testers.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraph 17.6 in Section 17 of the QA Manual, and paragraphs 4.6.7 and 4.6.9 in Procedure A-S-3, a review of welder/welding operator qualification records revealed that a qualification test record for submerged arc welding was missing for one welder, and qualification record cards were missing for two welders.

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Procedure CSP-45-T, a review of painting records for four nuclear projects revealed that three individuals had performed final inspection on paint coatings, and there was no documented evidence that they were qualified.

5. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Procedure W-Q-4, a review of calibration activities revealed that calibration records did not exist for welding equipment prior to 1982.

C. UNRESOLVED ITEMS:

None

ORGANIZATION: HARNISCHFEGER CORPORATION
MILWAUKEE, WISCONSIN

REPORT NO.: 99900088/82-01	INSPECTION RESULTS:	PAGE 3 of 4

D. OTHER FINDINGS OR COMMENTS:

1. Polar Cranes - Based upon discussions with Harnischfeger's QA personnel and a review of applicable documentation relating to coating defects and weld defects, the NRC inspector's findings were as follows:

   a. Coating Defects - The defects were detected at the site in the fall of 1979, and it was decided to completely dismantle both cranes to correct the identified coating and weld defects. A representative from Harnischfeger was at the Marble Hill site while the cranes were disassembled and the coating removed, welds repaired, new coating applied, and cranes reassembled. Newberg performed the weld repair and the coating work was done by J. C. Manta.

      During the original application of the inorganic zinc primer at the Harnischfeger plant, the paint was mixed and applied according to the vendor's product data sheet. Harnischfeger has experienced similar problems in the past with "dry spray" when using the particular product that was specified for the polar cranes for Marble Hill. Since Harnischfeger has not experienced the "dry spray" problem when using other types of inorganic zinc primer, they do not plan on using the particular primer used on the Marble Hill cranes for any future nuclear projects.

   b. Weld Defects - The defective welds on the cranes were made with the shielded metal arc welding process and required only a visual examination. Actions taken by Harnischfeger to improve the quality of similar weldments include the following: (1) welding process changed from shielded metal arc to gas metal arc; (2) imposition of more stringent visual inspection standards; and (3) welds reinspected after surface preparation prior to painting.

2. QA Program - A detailed review of documentation (i.e., QA Manual, QC Manual, procedures, qualification records, calibration records, NDE Manual, Product Finishes Manual, audit reports, etc.) led to the identification of five nonconformances (see paragraph B, above) and the following additional comments:

   a. There was no documented evidence of indoctrination and training of QA personnel; and

ORGANIZATION: HARNISCHFEGER CORPORATION
MILWAUKEE, WISCONSIN

REPORT NO.: 99900088/82-01	INSPECTION RESULTS:	PAGE 4 of 4

b. The QA Manual and applicable procedures appear to require updating to satisfy the requirements of Appendix B to 10 CFR Part 50. An example of an observed discrepancy is that the organizational chart does not reflect the current organizational structure and positions with stop-work authority are not identified.

ORGANIZATION: ITT BARTON INSTRUMENTS
CITY OF INDUSTRY, CALIFORNIA

REPORT NO.: 99900113/82-03	INSPECTION DATE(S): 7/14-16/82	INSPECTION ON-SITE HOURS: 14

CORRESPONDENCE ADDRESS: ITT Barton Instruments
ATTN: Mr. T. J. Shideler
General Manager
900 South Turnbull Canyon Road
City of Industry, California 91749

ORGANIZATIONAL CONTACT: Mr. D. J. McClain, P. E., Quality Assurance Project Engineer
TELEPHONE NUMBER: (213) 961-2547

PRINCIPAL PRODUCT: Process Control Instrumentation

NUCLEAR INDUSTRY ACTIVITY: The current Nuclear Class 1E Equipment produced by ITT Barton is approximately 10% of the total annual sales.

ASSIGNED INSPECTOR: Alva L. Smith — 10-20-82
Alva L. Smith, Equipment Qualification Section, (EQS) — Date

OTHER INSEPCTOR(S):

APPROVED BY: H. S. Phillips — 10-21-82
H. S. Phillips, Chief, EQS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B

B. SCOPE: This inspection was performed to observe the Equipment Qualification Testing of models 763 and 764 pressure transmitters in accordance with IEEE-323-1974 and NUREG 0588, Revision 1 which included procedure review, review of purchase orders for other test facility services, observation of functional testing after the 85-day post loss-of-coolant accident (LOCA) test and disassembly of two components, and review of test documentation.

PLANT SITE APPLICABILITY: The pressure transmitters are currently being tested for use at the Waterford Nuclear Site, Docket No. 50-382.

ORGANIZATION: ITT BARTON INSTRUMENTS
CITY OF INDUSTRY, CALIFORNIA

REPORT NO.: 99900113/82-03	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D OTHER FINDINGS OR COMMENTS:

1. Test Procedure Evaluation

A copy of revision 2 of ITT Barton Test Procedure 999/3154.2, "Design Qualification Test Procedure for ITT Barton Models 763 Gage Pressure and 764 Differential Electronic Transmitters for Class 1E Service In Nuclear Power Plants," was furnished to the NRC inspector. A brief review of this procedure was made during the inspection to determine if actual testing complied with the procedure. All testing and disassembly reviewed and witnessed by the inspector was accomplished in accordance with this procedure.

A more detailed review of the above procedure to determine compliance with criteria specified in the applicable IEEE standards is being performed and will be reported separately.

2. Test Specimen Selection

ITT Barton documentation was reviewed and employee interviews were conducted to determine how the test specimens were selected. This was necessary to determine that the specimens selected for generic qualification testing were standard production line and that no special care or considerations were taken in the selection of the materials, the manufacturing process or the production testing other than those normally specified and required by ITT Barton. Based on the results of this portion of this inspection, the NRC inspector determined that the specimens being tested represented typical "production line" models.

3. Quality Assurance Program

For this particular qualification test program ITT Barton chose to have the radiation aging accomplished at the Georgia Institute of Technology; the seismic testing at the Southwest Research Institute; and the LOCA

ORGANIZATION: ITT BARTON INSTRUMENTS
CITY OF INDUSTRY, CALIFORNIA

REPORT NO.: 99900113/82-03	INSPECTION RESULTS:	PAGE 3 of 3

testing at the Westinghouse Electric Corporation. The NRC inspector reviewed the ITT Barton procurement documents issued to all three firms to assure that the applicable quality assurance requirements were suitably included and/or referenced in these documents for the particular services and in all three cases they were.

In addition to the above, ITT Barton Quality Assurance conducted audits of each of the three firms and these audit reports were reviewed. It was determined that these audits were conducted in accordance with ITT Barton procedures.

4. Witnessing of Test

After completion of the 85-day post-LOCA test conducted in-house at ITT Barton, the test specimens were removed from the chamber and calibration checks, time response tests, overrange and safe pressure tests were all completed. One model 763 transmitter (S/N 1061) and one model 764 transmitter (S/N 327) were randomly selected for disassembly. Both transmitters were completely disassembled and visually and dimensionally inspected. No abnormalities were noted during the disassembly. After completion of this inspection both units were placed in bonded storage.

After completion of the 85-day post-LOCA test, the specimens were functionally tested in accordance with paragraph 7.4.12 of the test procedure. Three of 12 specimens (specimens 763-412, 763-1001, and 764-363) did not respond to input pressures; therefore, time response testing, in accordance with paragraph 7.4.12 of the test procedure, was not accomplished on these three specimens. ITT Barton was in the process of issuing a Notice of Deviation for those specimens which failed to respond. The NRC inspector will follow up on this item during a future inspection. (8203-01).

5. Test Documentation

The test reports issued by the firms conducting the radiation, seismic, and LOCA tests, as well as the ITT Barton "real time" quality assurance test witness logs were reviewed. All reports and logs were in accordance with the applicable procedures and did not contain any unexplained anomalies.

RGANIZATION: ITT GRINNELL
PIPE HANGER DIVISION
WARREN, OHIO

EPORT O.: 99900282/82-01	INSPECTION DATE(S) 10/18-20/82	INSPECTION ON-SITE HOURS: 25

ORRESPONDENCE ADDRESS: ITT Grinnell
Pipe Hanger Division
ATTN: Mr. D. M. Sewell, Vice Pres. & Director of QA
621 Dana Avenue
Warren, OH 44481

RGANIZATIONAL CONTACT: Mr. D. M. Sewell, Vice Pres. & Director of QA
ELEPHONE NUMBER: (216) 373-1500

RINCIPAL PRODUCT: Component Supports

UCLEAR INDUSTRY ACTIVITY: Approximately 70% of ITT Grinnell's (ITT) work is devoted to the commercial nuclear power industry.

ASSIGNED INSPECTOR: L. E. Ellershaw, Reactive & Component Program Section (R&CPS) — Date: 11-26-82

OTHER INSPECTOR(S): J. W. Hamilton, R&CPS

APPROVED BY: for W. Barnes, Chief, R&CPS — Date: 11-26-82

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was conducted as a result of receipt of a 10 CFR 50.55(e) Construction Deficiency Report (CDR) from Tennessee Valley Authority (TVA) regarding specification of incorrect weld inspection requirements on hanger drawings by ITT for Bellefonte Nuclear Plant, Units 1 and 2. Additional areas inspected included previous inspection findings and followup
(cont. on next page)

PLANT SITE APPLICABILITY:

Docket Nos. 50-438 and 50-439.

ORGANIZATION: ITT GRINNELL
PIPE HANGER DIVISION
WARREN, OHIO

REPORT NO.: 99900282/82-01	INSPECTION RESULTS:	PAGE 2 of 7

SCOPE: (cont.) on an item identified during a previous inspection at the ITT facility in Providence, Rhode Island, pertaining to offcenter welding of snubber extension pieces.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

ITT has specified on hanger sketches both the wrong type of support (plate and shell versus linear) for certain items, and the wrong nondestructive examination requirements for the welds associated with those items. A review is being conducted by ITT; however, certain sketches with identified discrepancies have not yet been revised (see paragraph E).

D. PREVIOUS INSPECTION FINDINGS:

1. Unresolved Item Identified at ITT, Warren, Ohio, Inspection Report 99900282/81-01:

An unresolved item was identified during an inspection conducted at ITT's Warren, Ohio, facility which pertained to Procedure PE-217-1, "Installation Instructions-ITT Grinnell Pipe Hangers," not addressing the use of spacers at the rear bracket end of sway struts. If the spacers are not installed, the spherical ball bearing may become completely disengaged for certain sized struts.

ITT revised Procedure PE-217-1 and issued Revision 2 on March 2, 1981, with the subsequent Revision 3 being issued on October 16, 1981. Section V, "Sway Struts," paragraph 2.b states, "Attach the structural attachment insuring that the spacers provided with the assembly are properly installed. There must be one spacer on each side of the rod end assembly to insure that the ball bushing will remain centered on the load pin so that the full ±5° swing can be obtained."

ITT distributed the revised procedure to the following customers on the indicated date:

TVA - March 11, 1981;

Texas Utilities Services, Inc. - March 11, 1981;

Stone & Webster Engineering Corporation - (Nine Mile Point) - April 28, 1981; and

Associated Piping and Engineering Company (WPPSS, Units 3 and 5) - February 10, 1982.

This item was reviewed and resolved during an inspection at ITT's Engineering Department, Providence, Rhode Island. It was noted in Inspection Report 99900285/82-01 and is restated here for continuity purposes.

2. Unresolved Item Identified at ITT, Warren, Ohio, Inspection Report 99900282/81-01:

An unresolved item was identified during an inspection at ITT's Warren, Ohio, facility pertaining to deficient welding symbology used in ITT drawings, as reported by TVA in a CDR regarding Bellefonte, Units 1 and 2. ITT designated the use of fillet welds for skewed T-joints having angles less than 60° or more than 135°. AWS D1.1 requires groove welds for these configurations. ITT deleted the parenthesis around dimensions in the welding symbols on certain detail sheets resulting in depth of groove weld preparation being indicated rather than the intended groove weld throat size.

Prior to February 1, 1979, all welds were designated as fillet welds by ITT. An informal document titled "Everything You Ever Wanted to Know About Fillet Welds and Were Afraid to Ask!" was developed and issued on February 1, 1979. This document was used as a training aid for the engineering department personnel. This document addressed the requirements of AWS D1.1, in addition to ASME Code requirements. As a result, the introduction of groove welds in angles less than 60° or greater than 135° was made, and all drawings developed after that date reflect groove welds rather than fillet welds. TVA had accepted numerous drawings (pre-1979) which showed fillet welds.

The problem arose when TVA received drawings which were developed after February 1979 and which showed groove welds.

The contract documents between TVA and ITT reference both ASME Code Section IX and AWS D1.1. ITT's design calculations determine a required load per linear inch based upon joint loading and geometry. These values are compared with Engineering Standard ES-16, "Weld Design Procedure For Component Supports," which is applicable for welded connections under the jurisdiction of the ASME Code. Allowable loads per linear inch were calculated for the various fillet weld sizes, and it was determined that the weld metal allowable load based on the calculated effective throat always exceeded the allowable loads stated in ES-16, thus the fillet welds meet ASME Code requirements.

ITT's policy pertaining to the use of parenthesis in bevel groove weld symbols is that dimensions refer to effective throat and not depth of preparation, regardless of whether or not the parenthesis is omitted.

In addition, the tail of the symbols shows, "no machining required"; thus there would not be a depth of preparation. Further, these welds are field welds and AWS D1.1 states that the engineer (designer) cannot specify the "depth of groove" without knowing the welding process and/or position of welding. AWS D1.1 is explicit in stipulating that only the effective throat is to be specified on design drawings for partial joint penetration groove welds.

This item was reviewed and resolved during an inspection at ITT's Engineering Department, Providence, Rhode Island. It was noted in Inspection Report 99900285/82-01 and is restated here for continuity purposes.

3. Unresolved Item Identified at ITT's Engineering Department, Providence, Rhode Island, Inspection Report 99900285/82-01:

This item was originally identified and noted during an inspection at ITT, Warren, Ohio, as an item requiring further inspection (Inspection Report 99900282/81-01). Further review at ITT, Providence, Rhode Island, resulted in its being identified as an unresolved item, in which ITT used a rivet material that had not been approved by the ASME Code.

Code Case N-249-2 which was approved by the ASME Code on June 17, 1982, incorporates the identified rivet material for use in the construction of Class 1, 2, 3, and MC component supports.

This item is considered resolved and will be noted in the inspection report following the next scheduled inspection at ITT, Providence, Rhode Island.

4. Followup Item Identified at ITT's Engineering Department, Providence, Rhode Island, Inspection Report 99900285/82-01:

This item dealt with a snubber in which a 6" extension piece had been welded 1/4" off center. At the time of the ITT, Providence inspection, the ITT, Warren QC Manager committed to a thorough review of the welding/inspection process for this item.

The cause of the problem could not be positively established; however, the consensus is that it was fixture-related.

The NRC inspector reviewed the fixture which had been modified to preclude the possibility of welding offcenter attachments and observed the set-up, welding, and inspection processes.

ITT has implemented their committed actions and this item is considered closed and will be noted in the inspection report following the next scheduled inspection at ITT, Providence, Rhode Island.

5. (Closed) Nonconformance (Inspection Report No. 99900285/82-01):

This item dealt with verification in accordance with the requirements of product drawings not being performed, in that the product drawings specified the use of carbon steel washers in mechanical shock suppressors, Figures 306 and 307, but brass washers were actually used.

The NRC inspector verified that ITT have implemented their committed corrective actions. All nonconforming (brass) washers have been removed from the shop floor area and retraining sessions were conducted for QC examiners. Further, review of washer procurement documents showed that the purchasing department was complying with procedures for the purchase of shop manufacturing materials.

This item is considered closed and will be noted in the inspection report following the next scheduled inspection at ITT, Providence, Rhode Island.

ORGANIZATION: ITT GRINNELL
PIPE HANGER DIVISION
WARREN, OHIO

REPORT NO.: 99900282/82-01	INSPECTION RESULTS:	PAGE 6 of 7

E. OTHER FINDINGS OR COMMENTS:

10 CFR Part 50.55(e) Construction Deficiency Report:

TVA made a notification to the NRC on March 1, 1982, that ITT specified incorrect nondestructive examination (NDE) requirements for field welds on hanger sketches provided to Bellefonte Nuclear Plant, Units 1 and 2. TVA initiated nonconforming condition Report No. 1748 on February 17, 1982, which identified the following four ASME Class 2 hanger sketches with incorrect weld NDE requirements:

1NS MPHG 0006, Revision 4; 1NS MPHG 0039, Revision 6; 1NS MPHG 0076, Revision 8; and 1NS MPHG 0112, Revision 7. A review of these hanger sketches revealed the following:

a. 1NS MPHG0006, Revision 4 - ITT specified fillet welds C, D, E, F, G, and H, to be examined by ASME Code, Subsection NF-5231 "Class 3 Plate and Shell Type Support Welds." The requirement should be NF-5221 "Class 2 Plate and Shell Type Support Welds." This sketch has not yet been revised.

b. 1NS MPHG 0039, Revision 6 - ITT specified item 4 as being a plate and shell support with the associated weld designated as NF-5222, "Class 2 Linear Type Support Weld." The sketch was revised to show item 4 as a linear type support.

c. 1NS MPHG 0076, Revision 8 - ITT designated item 1 as a plate and shell support and item 2 as a linear support, and the associated weld (a) designated as NF-5221. Further, item 1 was to be welded to supplemental steel (weld g) and examined under NF-5222.

   TVA specified item 1 as being supplemental steel; thus NDE is not required for weld (g). This also changes the requirements for weld (a) to NF-5222.

   ITT has revised the sketch (Revision 9) to reflect these changes.

d. 1NS MPHG 0112, Revision 7 - ITT designated item 9 as a plate and shell type support and the associated weld (e) to be examined by NF-5222, which is incorrect. ITT is now considering item 9 to be linear, which does require NF-5222. However, the sketch has not yet been revised.

ORGANIZATION: ITT GRINNELL
PIPE HANGER DIVISION
WARREN, OHIO

REPORT NO.: 99900282/82-01	INSPECTION RESULTS:	PAGE 7 of 7

ITT has conducted a review of sketches for four other systems. ITT provided the NRC inspector with copies of the above sketches, but the results of the review and all other hanger sketches are located at ITT, Providence, Rhode Island. The generic aspects of this identified problem could not be examined at this time; therefore, this item is considered unresolved and will require followup during the next scheduled inspection at ITT, Providence, Rhode Island.

GANIZATION: LIMITORQUE CORPORATION
LYNCHBURG, VIRGINIA

PORT .: 99900904/82-01	INSPECTION DATE(S) 7/27/82, 8/23/82, & 9/14-15/82	INSPECTION ON-SITE HOURS: 38

RRESPONDENCE ADDRESS: Limitorque Corporation
ATTN: Mr. W. J. Denkowski
Vice President Engineering
5114 Woodall Road
Lynchburg, Virginia 24506

RGANIZATIONAL CONTACT: Mr. J. B. Drab
ELEPHONE NUMBER: (804) 528-4400

RINCIPAL PRODUCT: Electric Motor Operated Valve Actuator Assemblies

UCLEAR INDUSTRY ACTIVITY: Limitorque Corporation supplies safety-related lectric motor operated valve actuator assemblies for valve operation to the uclear industry. This represents approximately 5% of their total production.

SSIGNED INSPECTOR: A. R. Johnson — 12/10/82
A. R. Johnson, Equipment Qualification Section (EQS) — Date

THER INSPECTOR(S): H. S. Phillips, EQS

APPROVED BY: H. S. Phillips — 12/10/82
H. S. Phillips, Chief, EQS — Date

NSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE:

1. A management meeting was held to explain the NRC Region IV Equipment Qualification Inspection Program and current test programs and schedules.
(cont. on next page)

PLANT SITE APPLICABILITY:

The Class 1E Limitorque valve control assemblies are supplied to various PWR nuclear power generating station applications.

ORGANIZATION: LIMITORQUE CORPORATION
LYNCHBURG, VIRGINIA

REPORT NO.: 99900904/82-01	INSPECTION RESULTS:	PAGE 2 of 4

SCOPE: (Cont.)

2. The purpose of the inspection was to witness the first 12 hours of a loss-of-coolant accident (LOCA)/high energy line break (HELB) environmental qualification (30-day) test, for a Limitorque valve control assembly (type SMB-00 valve actuator with a newly developed Reliance type LR electric motor). The Class 1E equipment was to be qualified in accordance with IEEE Standards 323-1974, 344-1975, 382-1980, and NUREG-0588, Revision 1, Category I with reduced requirements as specified by two reactor manufacturers.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Initial Management Meeting:

a. On July 27, 1982, the accompanying Region IV EQS supervisor presented to Limitorque management the NRC Region IV EQ Inspection Program. The presentation covered the Region IV Vendor Program Branch Inspection Program policies, authority, responsibility, objectives, and activities relating to test laboratory services. The status of proposed 10 CFR Part 50.49 was also discussed with Limitorque management.

b. Limitorque and NRC Region IV management discussed the mechanics of NRC EQ inspections including NRC access to proprietary data, purchase orders, and QA records at Limitorque and their subcontractors. The discussions were constructive and both now have a better understanding relative to how the respective organizations operate.

ORGANIZATION: LIMITORQUE CORPORATION
LYNCHBURG, VIRGINIA

REPORT NO.: 99900904/82-01	INSPECTION RESULTS:	PAGE 3 of 4

2. LOCA/HELB Environmental Qualification Test:

a. On August 23, 1982, the above test started obtaining the first qualification test profile (modified transient margin ramp) at 440° F/68 psig. Over the next 5 hours, the temperature/pressure test profile of IEEE 382-1980 (Figure 5, Case IV) was followed. At 1:30 p.m., on August 23, 1982, the second qualification test profile was obtained at the modified 440° F/68 psig and held for 2 minutes, followed by the temperature/pressure test profile of IEEE 382-1980 (Figure 5, Case IV). Approximately 28 hours into the test, during a scheduled functional check at the 280° F/36 psig plateau, the actuator motor experienced overcurrent in two of the three phases during the close stroke. Upon reaching the open limit position, both phases drew excessive overcurrent. The test was then terminated after two additional attempts to operate the actuator failed. The actuator motor was packaged and shipped to Reliance Electric Corporation for analysis.

b. On September 7, 1982, the results of Reliance Electric Corporation's analysis was submitted to Limitorque. The Reliance report indicated high temperature was the cause for the overcurrent condition, based on a color comparison analysis technique used by Reliance. Limitorque Corporation does not necessarily agree with the Reliance analysis and is currently reviewing the results. During a future inspection, the NRC inspector will review a report to be issued by Limitorque.

c. On August 23, 1982, approximately 7 minutes into the second qualification test profile at the 365° F/68 psig plateau, a momentary indication that the actuator had reached the full open position occurred. The anomaly was dispositioned as documented in a Limitorque memo to Mr. Joseph Drab, Special Projects Engineer, from Mr. Charles Cox, Assistant Chief Test Engineer, dated August 24, 1982. A limit switch (open position) malfunction occurred and was caused by drive cartridge loose bolting. The Limitorque disposition of this anomaly was that this occurrence was an isolated random failure. During a future inspection, the NRC inspector will review a report to be issued by Limitorque.

3. LOCA/HELB Environmental Qualification Test Rerun:

a. On September 14, 1982, the above test started obtaining the first qualification test profile (modified transient margin ramp) at 420° F/68 psig and held for 3 minutes before returning to the

stabilization temperature of 120° F. The second qualification test profile was then obtained at the modified 420° F/68 psig and held for 3 minutes followed by the modified test profile outlined in the Qualification Test Plan, Project 681063, Revision 4. Approximately 72 hours into the test (September 17, 1982), during a scheduled functional check, the Reliance motor malfunctioned and the test was again terminated. Limitorque is currently performing an evaluation to determine a course of action. During a future inspection, the NRC inspector will review a report to be issued by Limitorque.

4. Quality Assurance Manual Review:

The QA Manual, Nuclear Qualification Facility, was examined by the NRC Region IV inspector; however, an indepth review will be accomplished during a future QA review.

5. Inspection Results:

Within the scope of this inspection, the NRC inspector determined that:

a. Qualification test plans met the requirements of NUREG-0588, Revision 1.

b. Qualification test procedures conformed to the qualification test plans.

c. Test and test inspection activities were performed in accordance with detailed test procedures.

d. All necessary information and data collected to allow evaluation of test results were properly recorded and documented.

e. The installation of test specimens in the environmental test chamber was in accordance with the qualification test procedures.

f. Notice of Anomalies were prepared in a timely manner, properly documented, and properly dispositioned.

g. The Limitorque valve control assembly (SMB-00 actuator with Reliance type LR electric motor) did not meet the acceptance criteria as outlined in the qualification test plans during each of the LOCA/HELB tests of August 23, 1982, and September 14, 1982.

ORGANIZATION: MCC PACIFIC VALVES
LONG BEACH, CALIFORNIA

REPORT NO.: 99900075/82-01	INSPECTION DATE(S) 11/1, 2, & 5/82	INSPECTION ON-SITE HOURS: 17

CORRESPONDENCE ADDRESS: MCC Pacific Valves
ATTN: Mr. B. S. Rankin
President
3201 Walnut Street
Long Beach, CA 90807

ORGANIZATIONAL CONTACT: Mr. R. Michael - Manager of Quality Assurance
TELEPHONE NUMBER: (213) 426-2531

PRINCIPAL PRODUCT: ASME Section III "N" Class 1, 2, and 3 valves.

NUCLEAR INDUSTRY ACTIVITY: MCC Pacific Valves' contribution to the nuclear industry represents approximately 10 percent of its total workload.

ASSIGNED INSPECTOR: W. D. Kelley — 12/15/82
W. D. Kelley, Reactive & Component Program Section (R&CPS) — Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes — 12/15/82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21 and 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made as a result of the issuance of a 10 CFR Part 50.55(e) report by Florida Power & Light Company concerning the calculated stress for body to bonnet studs exceeding the allowable stress in 17 valves that have been furnished to St. Lucie Plant, Unit 2. Additional areas inspected included implementation of 10 CFR Part 21 and design and document control.

PLANT SITE APPLICABILITY:

50-389.

READEX FICHE best copy available

ORGANIZATION: MCC PACIFIC VALVES
LONG BEACH, CALIFORNIA

REPORT NO.: 99900075/82-01	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Florida Power & Light Company (FP&L): St. Lucie Plant, Unit 2 - Problem reported was the calculated stress for body to bonnet studs exceeding the allowable stress in 17 valves delivered to site.

   a. The NRC inspector reviewed the Ebasco Services, Incorporated (ESI) purchase order and design specification, and verified that the bolting material was not specified for valves.

   b. The NRC inspector reviewed the MCC Pacific Valves (MCC PV) drawings, shop job instructions, and correspondence with ESI, and ascertained that: (1) the original design specified that the stud material was to be SA 193, Grade B7, and the nut material was to be SA 194, Grade 2H; (2) ESI stated in their comments on the MCC PV drawings that, "The material for the bonnet studs shall be ASTM A193, GR B8 strain hardened, and material for the bonnet stud nuts shall be ASTM A194, GR B8 . . . ."; and (3) the MCC PV drawings and shop job instructions were revised in accordance with ESI comments, and the revisions were approved by the MCC PV project engineer.

   c. The NRC inspector reviewed MCC PV correspondence and discrepant material notices, and established that: (1) the MCC PV QA engineer had identified during documentation review that the ESI specified bolting material was not recognized by Section III of the ASME Code, receiving inspection had accepted the wrong class of material from the bolting material supplier, and the calculated stress of the installed bolting exceeded the allowable stress; (2) a discrepant material notice was issued; and (3) MCC PV notified FP&L that the calculated stress exceeded the allowable for the studs installed in 17 delivered valves.

d. The NRC inspector verified by document review that MCC PV had revised the drawings and shop job instructions to reflect a change in bolting material to ASME SA 564, Type 630 (1100), and that the revision had been approved by the design engineer. MCC PV actions to prevent recurrence were ascertained to have included: (1) establishment of a design review criteria checklist for assuring the accuracy of design documents; (2) instruction of receiving inspection and QA engineering with respect to material certification and testing requirements; and (3) establishment of standard material procurement clauses to and in procurement of correct material.

The checklist now requires (in addition to engineering and project engineer sign off and approval) that the engineering department head sign off and approve the design and revisions to any design. Instructions with respect to material certification and testing requirements were given to receiving inspection and QA engineering personnel as a result of acceptance of A194, Grade B8, Class 1 material when the purchase order had specified Class 2.

e. The NRC inspector verified by documentation review that MCC PV had shipped replacement bolting material to FP&L and had provided instructions on installation requirements for: (1) preserving the pressure integrity of the body/bonnet connection; (2) preventing damage to or a leak path through the bonnet gasket; and (3) recommended torque of replacement bolting.

2. Implementation of 10 CFR Part 21:

a. The NRC inspector verified that the MCC PV Material Review Board (MRB) had reviewed the discrepant material notice for the bolting in accordance with their quality assurance program and 10 CFR Part 21 procedures. The MRB was noted to have unanimously agreed that the material selection did not constitute a substantial safety hazard and was not reportable under the requirements of 10 CFR Part 21.

b. The NRC inspector established that the deficiency was attributable to the failure of both MCC PV engineering and the independent reviewer (project engineer) to review the customer specified material change with respect to ASME Code acceptability and design adequacy.

ORGANIZATION: MCC PACIFIC VALVES
LONG BEACH, CALIFORNIA

REPORT NO.: 99900075/82-01	INSPECTION RESULTS:	PAGE 4 of 4

3. Design and Document Control: The NRC inspector reviewed the applicable sections of the MCC PV ASME accepted quality assurance manual and two implementing procedures, and verified that the drawings and shop job order for one purchase order were revised and approved.

ORGANIZATION: MAGNETROL INTERNATIONAL, INC.
DOWNERS GROVE, ILLINOIS

REPORT NO.: 99900780/82-01	INSPECTION DATE(S): July 12-16, 1982	INSPECTION ON-SITE HOURS: 27

CORRESPONDENCE ADDRESS: Magnetrol International, Inc.
ATTN: Ms. J. G. Stevenson
President
5300 Belmont Road
Downers Grove, Illinois 60515

ORGANIZATION CONTACT: D. J. Stevenson/D. K. Frantzen
TELEPHONE: (312) 969-4000

PRINCIPAL PRODUCT: Level switches, level controllers

NUCLEAR INDUSTRY ACTIVITY: 2% of manufacturing activity is nuclear

ASSIGNED INSPECTOR: L B Parker 8/26/82
L. B. Parker, Reactive & Component Program Section (R&CPS) Date

OTHER INSPECTOR(S):

APPROVED BY: J. Barnes 8/30/82
I. Barnes, Chief, R&CPS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21 and 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made as a result of the issuance of a 10 CFR Part 50.55(e) report by the Southern California Edison Company pertaining to the corrosion failure of level alarm switches that have been furnished to San Onofre, Units 2 and 3. Additionally, QA program review, material traceability (ASME) and implementation of 10 CFR Part 21 were inspected.

PLANT SITE APPLICABILITY: 50-361, 50-362, 50-382, 50-333

ORGANIZATION: MAGNETROL INTERNATIONAL, INC.
DOWNERS GROVE, ILLINOIS

REPORT NO.: 99900780/82-01	INSPECTION RESULTS:	PAGE 2 OF 3

A. VIOLATIONS:

Contrary to paragraph 21.21(a) of 10 CFR Part 21 procedures had not been adopted for evaluating defects pertaining to Class 1E items.

B. NONCONFORMANCE:

Contrary to Criterion V of Appendix B to 10 CFR Part 50, Purchase Order No. 81-4801 issued by Power Authority of the State of New York, and Paragraph 4 of IEEE Standard 323-1974, a disciplined (i.e., documented) quality assurance program had not been established for the manufacture of Class 1E items.

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Reactive Item:

A Southern California Edison Company 10 CFR Part 50.55(e) report addressed Magnetrol-supplied flood level alarm switches used in safety-related applications at San Onofre Nuclear Station, Units 2 and 3 (SONGS).

The switches were inoperative due to corrosion, which was caused by leaking submersible NEMA 6 switch enclosures. The switch enclosures leaked in the following three areas: (1) through "sealed" rivets, which attached the nameplate to the enclosure; (2) through the connection between the enclosure base and cover; and (3) a grommeted hole in the enclosure cover, where a screw is provided for tightening the enclosure.

The leakage problem at SONGS has been corrected by replacing the NEMA 6 switch enclosure with a modified explosive proof (EP) enclosure (qualified to NEMA 6). The EP enclosure is of cast iron construction with the leaking areas corrected as follows: (1) the nameplate is no longer riveted to the enclosure; (2) the connection between the enclosure base and cover are threaded and gasketed (O-ring); and (3) elimination of the grommeted hole by threading of the cover.

ORGANIZATION: MAGNETROL INTERNATIONAL, INC.
DOWNERS GROVE, ILLINOIS

REPORT NO.: 99900780/82-01	INSPECTION RESULTS:	PAGE 3 OF 3

Magnetrol notified the following nine purchasers of the leakage problem and provisions have been made to replace the deficient switch enclosures: Baltimore Gas & Electric Company, Baltimore, Maryland; Bechtel Power Corporation, Gaithersburg, Maryland, and Los Angeles, California (SONGS); Commonwealth Associates, Inc., Jackson, Missouri; Consolidated Edison, New York, New York; Ebasco Services, Inc., Elma, Washington, and New York, New York (Waterford 3); Gilbert Associates, Inc., Reading, Pennsylvania; and Portland General Electric Company, Boardman, Oregon.

2. QA Program Review

a. Quality Assurance Program - On review of the vendor's QA program, the NRC inspector ascertained that Class 1E items had not been addressed in either their ASME accepted QA program, or in a separately documented QA program prepared in accordance with IEEE requirements (see paragraph B).

b. Material Traceability (ASME) - Three manufacturing routing packages were examined for completeness. They were found to have all inspection points complete, and heat code letters where required. Ten heat code letters were examined for traceability. The code letters were traceable to vendor's heat numbers and certified material test reports (CMTR). The vendors shown on the CMTR's were examined and found to be on the qualified vendor's list. The vendor's Quality System Certification was examined and found current in all cases examined.

c. Implementation of 10 CFR Part 21 - The NRC inspector reviewed the vendor's Standard Procedure Instruction No. CSA-003, "Reporting Defects and Non-Compliance to the NRC," and found that the procedure fails to address Class 1E items (see paragraph A).

Observations of the employee's bulletin board verified that the above vendor procedure, Section 206 of the Energy Reorganization Act of 1974, and 10 CFR Part 21, were posted.

ORGANIZATION: NATIONAL TECHNICAL SYSTEMS
SAUGUS, CALIFORNIA

REPORT NO.: 99900907/82-02	INSPECTION DATE(S) 6/21-22/82	INSPECTION ON-SITE HOURS: 24

CORRESPONDENCE ADDRESS: National Technical Systems
ATTN: Arthur Edelstein
Executive Vice President
26525 Golden Valley Road
Saugus, CA 91350

ORGANIZATIONAL CONTACT: Mr. Arthur Edelstein
TELEPHONE NUMBER: (805) 251-6622

PRINCIPAL PRODUCT: Testing Services.

NUCLEAR INDUSTRY ACTIVITY: The National Technical Systems (NTS) test laboratories, located at Saugus, California, currently use 15-22% of its manpower for equipment qualification testing of safety-related equipment for the commercial nuclear power industry.

ASSIGNED INSPECTOR: J. R. Agee, Equipment Qualification Section (EQS) 9/23/82 Date

OTHER INSPECTOR(S): A. L. Smith, EQS
H. S. Phillips, EQS

APPROVED BY: H. S. Phillips, Chief, EQS 9-23-82 Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: The purpose of this inspection was to: (1) conduct a management meeting to explain the Region IV Equipment Qualification Inspection program and obtain information about the NTS organization; (2) perform a followup inspection relative to an allegation made against an NTS employee; and (3) witness the initial testing of the Borg Warner modulating electro-hydraulic valve operator.

PLANT SITE APPLICABILITY:

NTS is testing the Borg Warner modulating electro-hydraulic valve operator for generic applications in the nuclear power industry with the first target nuclear plant being Waterford 3.

ORGANIZATION: NATIONAL TECHNICAL SYSTAEMS
SAUGUS, CALIFORNIA

REPORT NO.: 99900907/82-02	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Initial Management Meeting: The accompanying Region IV supervisor made a presentation to NTS management to describe and explain the Region IV Equipment Qualification Inspection Program. The presentation covered NRC and Region IV organizations, bases for inspection, history of the EQ program, and status of proposed rules being developed and in the adoption process. NRC fact sheets, organization charts, and other handouts were provided to NTS management.

   Following the NRC presentation, NTS management made a presentation describing NTS organizational structure, facility locations, test capability, and operations. In addition to the NTS Saugus test facility, other NTS facilities in the Los Angeles area can provide specialty work; for example, design, machining, and fabrication of test fixtures and auxiliaries. NTS stated that they have made numerous commitments to conduct environmental qualification tests of safety-related equipment which may be exposed to a harsh environment.

   The NRC inspectors toured the test facility to determine the extent of testing in progress and test capability.

2. Followup Inspection Regarding An Allegation

   a. Background

      On February 5, 1982, the Public Affairs Office, Region V received an anonymous telephone call from an individual who identified himself as a university professor. He stated that a fellow faculty member of California State Polytechnic University, San Luis Obispo, California, had worked at NTS performing safety-related work involved with the nuclear industry. The caller then made an allegation relative to the work performed by his fellow faculty member.

The alleger stated that his fellow worker had been involved with seismic qualification testing of nuclear components and questioned the quality of his work because the faculty considered him "incredibly incompetent, lazy, a big talker, and a joke."

b. Findings

During this inspection, the NRC inspector interviewed NTS Management concerning the employee. Management stated the employee had a satisfactory performance record. He was initially employed as a technical writer for the compilation of equipment specifications and analyses. He received assignments and performed functions in the analysis of equipment, some of which concerned nuclear safety-related equipment. The work performed did not represent a final autonomous technical position by the employee. His work was reviewed and approved by his manager, a professional engineer. He was reportedly a conscientious employee. The quality of his work was acceptable and seldom needed correction.

Subsequent to the NRC receipt of the allegation, the employee left the company with a good work record. His departure was not due to professional incompetence, but due to lack of workload for his area of expertise.

The NRC inspector reviewed NTS files and selected two analyses performed by the individual alleged to be incompetent.

These analyses were based on test criteria of NUREG 0588 and IEEE Standards 323-1974 and 344-1975, test criteria for Class 1E electrical devices for nuclear power electrical stations. The NRC inspector considered the documents to be adequate for use in the qualification of Class 1E safety-related equipment.

The allegation was not substantiated. The interview with management and review of records revealed satisfactory performance by the former employee.

3. Equipment Qualification Testing Inspection: This portion of the inspection was to: (1) review the final test procedure and the acceptance test plan; (2) witness the initial functional testing of the valve actuator and development of the test baseline data; and (3) witness the initial stage of the thermal aging test.

ORGANIZATION: NATIONAL TECHNICAL SYSTEMS
SAUGUS, CALIFORNIA

REPORT NO.: 99900907/82-02	INSPECTION RESULTS:	PAGE 4 of 4

The NRC inspector initiated inspection in the three areas described above; however, Borg Warner, the test sponsor, decided to reverify the test plan and procedures which required additional contract negotiations. NRC evaluation and inspection of the test plan and subsequent test phases will be completed when NTS receives an approved test plan.

ORGANIZATION: NUCLEAR ENERGY SERVICES, INC.
NES DIVISION
DANBURY, CONNECTICUT

REPORT NO.: 99900762/82-01	INSPECTION DATE(S) 10/20-21/82	INSPECTION ON-SITE HOURS: 12

CORRESPONDENCE ADDRESS: Nuclear Energy Services, Inc.
NES Division
ATTN: Mr. W. J. Manion, President
1000 Shelter Rock Road
Danbury, CT 06810

ORGANIZATIONAL CONTACT: Mr. F. J. Williams, Jr., Acting Mgr., Quality Assurance
TELEPHONE NUMBER: (203) 748-3581

PRINCIPAL PRODUCT: Engineering and NDE Services, and fuel racks and tool fabrication.

NUCLEAR INDUSTRY ACTIVITY: The company's activities are 98% nuclear related.

ASSIGNED INSPECTOR: R. E. Oller — 11-23-82
R. E. Oller, Reactive & Component Program Section (R&CPS) — Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes — 11-23-82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and 10 CFR Part 21.

B. SCOPE: Status of previous inspection findings and 10 CFR Part 21.

PLANT SITE APPLICABILITY:

Calvert Cliffs, Units 1 and 2, 50-317/318; LaCrosse, 50-409; North Anna, Units 1 and 2, 50-338/339.

ORGANIZATION: NUCLEAR ENERGY SERVICES, INC.
NES DIVISION
DANBURY, CONNECTICUT

REPORT NO.: 99900762/82-01	INSPECTION RESULTS:	PAGE 2 of 6

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Nonconformance A (81-01): Failure to perform formal internal audits of all sections of the NES QA manual on an annual basis since January 1980 as required by Section 18 of the NES QA Manual 80A9002.

   The NRC inspector verified that in accordance with the vendor's corrective action response letter dated January 12, 1982, NES performed an internal systems audit of all 18 criteria of 10 CFR Part 50, Appendix B during the week preceding March 31, 1982, as applicable to each of the 3 QA manuals for general engineering, inservice inspection, and QA services. Also, paragraph 18.3.2 of the General Engineering QA Manual 90A9002 was revised to allow utilization of all project, site, and systems audits in the internal audit program where the scope of the specific audit covered the entire section of the manual audited.

2. (Closed) Nonconformance B (81-01): Failure to properly qualify the auditor who performed Audit No. 155 (Records) on September 18, 1980, as required by Section 18 of the NES QA Manual 80A9002.

   The NRC inspector verified that in accordance with the vendor's corrective action response letter dated January 12, 1982, the deficiency was actually due to the auditor not being properly identified in the audit report as only a team member and not the lead auditor. The specific training requirements of paragraph 18.3.3 apply only to lead auditors. To clarify the record, an addendum dated January 7, 1982, identifying the audit team members was attached to Audit No. 155.

   To prevent recurrence, a standardized audit report format that identifies all audit team members was adopted in August 1981. Review

of Audit No. QAA-182, which was applicable to an audit performed on August 21 and 24, 1981, verified that the new format was being used.

3. (Closed) Nonconformance C (81-01): Failure to require that Supplier Nonconformance Reports (SNR), dealing with nonconforming items the supplier dispositioned as "Repair" or "Use-as-is," identify the cause of the nonconformance and the corrective action. Also, failure of the QA Manager's related supplier audits to show that complete compliance with SNR disposition and corrective action had been accomplished and verified as required by NES Procedure No. 80A9008.

   The NRC inspector verified that in accordance with the vendor's corrective action response letter dated January 12, 1982, the supplier in question (Metal Products Corporation) was notified in writing on January 5, 1982, that NES would accept only those SNR's which met the requirements of Procedure No. 80A9008.

   To prevent recurrence, paragraph 5.0 of Procedure No. 80A9008 was revised to clarify that the intent of supplier audits was to spot check compliance with SNR dispositions and corrective action, and that the spot checks shall be documented in audit trip reports. Review of Audit No. QAA-195 dated April 14-15, 1982, verified that a spot check was made of SNR's at Metal Products Corporation.

4. (Closed) Nonconformance D (81-01): Failure by NES to determine that their suppliers' welding procedure specifications (WPS) permitted unqualified changes in ASME Section IX Code essential variables.

   The NRC inspector verified that in accordance with the vendor's corrective action response letter dated January 12, 1982, the two NES/Selamco WPS's in question were revised and one was requalified. Of the three Metal Products Corporation WPS's in question, one was deleted from the work and the other two were revised and requalified.

   To prevent recurrence, NES/Selamco contracted in December 1981 for a welding consultant's services to aid in reviewing all current and future WPS's. In addition, an NES design engineer and a QA engineer were given formal training in welding.

5. (Closed) Nonconformance E (81-01): Failure by the Project Engineer to issue a Quality Assurance Program Plan (QAPP) as early as practical for the La Crosse Boiling Water Reactor (LACBWR) project as required by the NES QA Manual 80A9002.

The NRC inspector verified that in accordance with the vendor's corrective action response letter dated January 12, 1982, paragraph 2.4.2 of the QA Manual 80A9002 was revised on March 31, 1982. This change defined that a QAPP will be prepared for a project when it is determined by the QA Manager and Project Manager that project customer QA and quality requirements are in excess of QA manual requirements. If no QAPP is determined to be required, work will be performed in accordance with the QA manual and implementing procedures.

Review verified that an NES QAPP for the North Anna, Units 1 and 2 spent fuel rack project was approved on April 7, 1982.

6. (Closed) Nonconformance F (81-01): Failure by the Task Engineer to meet the requirements of the Design Calculation Notebook Procedure No. 80A9004 for Task No. 5101-052, LACBWR Project.

   The NRC inspector verified that in accordance with the vendor's corrective action response letter dated January 12, 1982, all of the calculations with identified deficiencies were reviewed as shown in the update record of the Calculation Notebook for Task Force No. 5101-052 (LACBWR). This review was performed to assure that the inclusion of all the requirements of Procedure No. 80A9004 were met.

   To prevent recurrence, the applicable parts of Procedure No. 80A9004 were revised on February 4, 1982, to further define requirements for calculations. Also, a retraining program for engineering personnel was conducted on February 19, 1982, on the requirements of the Calculation Notebook Procedure.

7. (Closed) Nonconformance G (81-01): Failure to have an independent check performed of a battery charger anchorage calculation prior to issuing the approved design sketch SK-5101-063-7 as required by the Design Calculation Notebook Procedure No. 80A9004.

   The NRC inspector verified that in accordance with the vendor's corrective action response letter dated January 12, 1982, the above calculation was checked on October 22, 1981, and found to be accurate as shown on page 14 of the Calculation Notebook for Project/Task 5101-063 (LACBWR).

   To prevent recurrence, a retraining program for engineering personnel was conducted on February 19, 1982, on the requirements of the Calculation Notebook Procedure.

8. (Closed) Nonconformance H (81-01): Failure to perform several elements of administrative control for code files ANSYS and KENO-IV as required by the Computer Code Documentation Control Procedure No. 80A9010.

   The NRC inspector verified that in accordance with the vendor's corrective action response letter dated January 12, 1982, the code files for ANSYS and KENO-IV were reviewed and brought up-to-date on October 30, 1981, in order to meet the requirements of Procedure No. 80A9010.

   To prevent recurrence, paragraphs 3.0 and 4.0 of Procedure No. 80A9010 were revised on March 3, 1982, to clearly identify administrative controls applicable to code files. A file usage log and signout cards were also developed and implemented.

9. (Closed) Nonconformance I (81-01): Failure to assure that all key staff and technical personnel attended training sessions as required by the QA Manual Nos. 80A9002 and 80A9021.

   The NRC inspector verified that in accordance with the vendor's corrective action response letter dated January 12, 1982, two general QA training sessions were conducted on December 18 and 21, 1981, for Danbury office engineering, inservice inspection (ISI), and QA services personnel. The records of indoctrination and training for 42 field NDE inspectors were reviewed by the QA Manager. A review was also made of all newly-hired ISI personnel, and a memorandum dated April 20, 1982, was issued concerning their QA Manual 80A9021 required attendance for general QA training.

10. (Closed) Nonconformance J (81-01): Failure to provide recertification requirements for nondestructive testing personnel in NES Procedure No. 99-CNTP-001 in accordance with the requirements of SNT-TC-1A (June 1975 Edition).

    The NRC inspector determined through additional review of this subject, that NES Procedure No. 99-CNTP-001 is in conformance with the requirements of SNT-TC-1A (June 1975 Edition) concerning recertification of NDE personnel. This item is not considered a nonconformance.

E. OTHER FINDINGS OR COMMENTS:

10 CFR Part 21: The NRC inspector reviewed the vendor's document, "Procedure for Compliance with 10 CFR Part 21," Specification No. 80A9036 dated

December 12, 1977, in order to verify that adequate documented measures are available with respect to the evaluation and reporting requirements of 10 CFR Part 21.

A notice to employees which included Section 206 of the Energy Reorganization Act of 1974 was observed posted on an employee bulletin board.

Within this area, no violations of 10 CFR Part 21 requirements were identified.

ORGANIZATION: POWER-STRUT DIVISION
VAN HUFFEL TUBE CORPORATION
WARREN, OHIO

REPORT NO.: 99900365/82-01	INSPECTION DATE(S) 10/20-22/82	INSPECTION ON-SITE HOURS: 26

CORRESPONDENCE ADDRESS: Power-Strut Division
Van Huffel Tube Corporation
ATTN: Mr. L. N. Mears, Manager, Quality Assurance
Dietz Road
Warren, OH 44481

ORGANIZATIONAL CONTACT: Mr. L. N. Mears, Manager, Quality Assurance
TELEPHONE NUMBER: (216) 372-1711

PRINCIPAL PRODUCT: Struts and fittings

NUCLEAR INDUSTRY ACTIVITY: Approximately 33% of their work is for the commercial nuclear power industry. Current work is being performed for the following sites: Millstone Nuclear Power Station, Unit 3; Nine Mile Point Nuclear Station, Unit 2; Seabrook Nuclear Station, Unit 1; Limerick Generating Station, Unit 1; Hope Creek Nuclear Generating Station, Units 1 and 2; Alvin W. Vogtle, Jr., Nuclear Plant, Unit 1; River Bend Station, Unit 1; Perry Nuclear Power Plant, Unit 1; and Shoreham Nuclear Power Station.

ASSIGNED INSPECTOR: L. E. Ellershaw, Reactive & Component Program Section (R&CPS) — Date: 11-30-82

OTHER INSPECTOR(S): J. W. Hamilton, R&CPS

APPROVED BY: for T. Barnes, Chief, R&CPS — Date: 11-30-82

INSPECTION BASES AND SCOPE:

A. BASES: Appendix B to 10 CFR Part 50.

B. SCOPE: This inspection was made as a result of: (1) a 10 CFR Part 21 report pertaining to shallow depth of strut nut serrations creating a potential reduced load carrying capacity for slip values in a shear loading condition; and (2) a potential 10 CFR Part 50.55(e) Construction Deficiency Report (CDR) relating to separation in spot welded areas of Power-Strut supports which had been furnished to Detroit Edison Company's Enrico Fermi Atomic Power Plant, Unit 2.

PLANT SITE APPLICABILITY:

Docket Nos. 50-458; 50-341; 50-410; 50-460, and 50-513.

ORGANIZATION: POWER-STRUT DIVISION
VAN HUFFEL TUBE CORPORATION
WARREN, OHIO

REPORT NO.: 99900365/82-01	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50, Quality Control Policy & Procedure Manual, Section 9.0 and AWS D1.1-75, the following conditions were identified during observation of inprocess gas metal arc welding (GMAW):

   a. The gas flow meter on the argon bottle was in a condition such that the welders could not verify compliance with the welding procedure specifications (WPS) gas flow rate requirements. The gas flow meter was encrusted with dirt and oil which made it impossible to view the gas flow rate.

   b. After scraping, cleaning, and reattaching the flow meter to the argon bottle, the equipment was turned on. The flow meter showed the gas flow rate to be approximately 18.5 cubic feet per hour (CFH); however, the WPS being used (PS-9-9) requires an argon flow rate of 30 CFH. This is a decrease of 10% or more in the rate of flow and accordingly represents an essential variable change which occurred without the establishment of a new procedure by qualification.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50, Quality Control Policy & Procedure Manual, Section 9.0 and AWS D1.1-75, three welders were improperly certified as being qualified for the performance of GMAW (fillet welds only), as neither the qualification records nor the qualification test plates showed any evidence of the fillet-weld-break test being performed, a requirement when Option 1 of the Fillet Weld Qualification Test is used. The welders and their last qualification dates were as follows:

   Welder No. 104 - July 12, 1982;
   Welder No. 802 - July 24, 1980; and
   Welder No. 452 - January 17, 1980.

C. UNRESOLVED ITEMS:

None

ORGANIZATION: POWER-STRUT DIVISION
VAN HUFFEL TUBE CORPORATION
WARREN, OHIO

REPORT NO.: 99900365/82-01	INSPECTION RESULTS:	PAGE 3 of 4

D. OTHER FINDINGS AND COMMENTS:

1. Potential 10 CFR Part 50.55(e) CDR:

Detroit Edison Company notified NRC Region III on February 11, 1982, of a potential CDR pertaining to the separation of resistance spot welds in cable tray support struts, PS-202, installed at Enrico Fermi Atomic Power Plant, Unit 2. Subsequent to this notification, 12 samples of PS-202 struts were sent to Detroit Testing Laboratory where all 12 samples were found to exhibit resistance spot weld failures. This strut material had been shipped to the site in the 1977-1979 time frame.

Prior to February 6, 1979, there were no formal quality control requirements relative to testing of resistance spot welded struts. As a result of similar deficiencies identified at Pennsylvania Power & Light Company's Susquehanna Steam Electric Station, Units 1 and 2 in a CDR dated April 26, 1978, and addressed in NRC Report No. 99900365/79-01, Power-Strut developed destructive test procedure, "Spot Weld Destructive Test, Procedure No. SP DT-1-79," which describes a test to separate strut members (chisel test) and acceptance criteria (3/16" minimum weld nugget). Subsequently, a shear test procedure was developed which specified minimum shear test values. The only contracts which required shear tests to be performed are: Susquehanna, Hope Creek, and Limerick. None were performed on the Susquehanna work because all welded struts had been completed prior to the development of the procedure.

Apparent causes of the spot weld failures relate to the use of mill galvanized material with slight variations in material chemistry and potential voltage variations in the common plant transformer.

Currently, Power-Strut uses, for nearly all mill galvanized material, a four-headed spot welding machine which has its own transformer. Chisel and shear tests have verified that spot welds made by this equipment are uniform and consistent.

2. 10 CFR Part 21 Report:

A 10 CFR Part 21 report was initiated by Power-Strut on November 9, 1981, and revised on November 25, 1981, describing a potential reduced load carrying capacity in slip values of strut nuts in a shear loading condition due to shallow depth of strut nut serrations. Power-Strut notified the facilities which received these strut nuts (River Bend, WPPSS, Units 1 and 4, and Nine Mile Point) on November 10, 1981.

ORGANIZATION: POWER-STRUT DIVISION
VAN HUFFEL TUBE CORPORATION
WARREN, OHIO

REPORT NO.: 99900365/82-01	INSPECTION RESULTS:	PAGE 4 of 4

The cause of this condition was the use of a press with insufficient tonnage which produced shallow serrations in the strut nuts. At the time this condition occurred, there were no procedures specifying the use of a specific press (60 ton or 150 ton). However, there was a place on the routing sheet in which manufacturing personnel were to write in the particular press that was used. Power-Strut's evaluation showed that those strut nuts which had serrations formed by the 60 ton press were the only ones affected. Because manufacturing indicated the press used for the operation, Power-Strut was able to identify the specific lots and where they were shipped. The only strut nut involved is part No. PS-9277 - ½".

Based upon slip testing performed between October 16, 1981, and March 5, 1982, using different parameters (e.g., depth of serration, bolt materials, and torque values of nuts), it was concluded that serrations had to be a minimum depth. Therefore, procedure "PS-9227 Strut Nut Blank Inspection" was generated which establishes acceptance criteria and requires inspection of serration depth.

Nine Mile Point had received 2,000 strut nuts which were returned to Power-Strut for replacement.

WPPSS, Units 1 and 4 returned 4,225 strut nuts they received for inspection and replacement.

River Bend has received 13,400 strut nuts of which slightly over 10,000 have been returned for inspection/replacement. The decision to return the remainder rests with River Bend.

ORGANIZATION: RAYMOND CONTROL SYSTEMS
A BRUNSWICK COMPANY
ST. CHARLES, ILLINOIS

REPORT NO.: 99900782/82-01	INSPECTION DATE(S) 8/9-13/82	INSPECTION ON-SITE HOURS: 25

CORRESPONDENCE ADDRESS: Raymond Control Systems
A Brunswick Company
ATTN: Mr. E. Flannery, General Manager
315 Kirk Road
St. Charles, Illinois 60174

ORGANIZATIONAL CONTACT: Mr. F. Volmer
TELEPHONE NUMBER: (312) 377-4000

PRINCIPAL PRODUCT: Electric Rotary Actuators

NUCLEAR INDUSTRY ACTIVITY: Approximately six percent

ASSIGNED INSPECTOR: J. Barnes for W. E. Foster, Reactive and Component Program Section (R&CPS) — Date: 10-28-82

OTHER INSPECTOR(S):

APPROVED BY: J. Barnes — I. Barnes, Chief, R&CPS — Date: 10-28-82

INSPECTION BASES AND SCOPE:

A. BASES: Appendix B of 10 CFR Part 50 and 10 CFR Part 21.

B. SCOPE: This inspection was made as a result of the issuance of a 10 CFR Part 50.55(e) report by Mississippi Power and Light Company. The report pertained to improperly crimped terminals on electrical wiring in damper actuators that had been furnished to the Grand Gulf Nuclear Station, Unit Nos. 1 and 2.

PLANT SITE APPLICABILITY:

Docket Nos.: 50-416/417.

ORGANIZATION: RAYMOND CONTROL SYSTEMS
A BRUNSWICK COMPANY
ST. CHARLES, ILLINOIS

REPORT NO.: 99900782/82-01	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATIONS:

1. Contrary to Section 21.6 of Title 10, Part 21 of the Code of Federal Regulations, dated December 18, 1981, current copies of 10 CFR Part 21 and Section 206 of the Energy Reorganization Act of 1974 or a notice had not been posted in the St. Charles or West Chicago facility. The posted copies of 10 CFR Part 21, at the St. Charles facility, were dated July 22, 1977, and August 1, 1980. No copies were posted at the West Chicago facility.

   This is a Severity Level V violation (Supplement VII).

2. Contrary to Section 21.21(a) of Title 10, Part 21 of the Code of Federal Regulations, dated December 18, 1981, procedures had not been adopted to provide for: (1) evaluating deviations or informing the licensee or purchaser; and (2) assuring that a director or responsible officer is informed if the supplied basic component (a) fails to comply or (b) contains a defect.

   This is a Severity Level V violation (Supplement VII).

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraphs 4.4, 5.1, and 5.2 of the Quality Assurance Manual, dated April 10, 1979, Quality Assurance had not reviewed work instructions as evidenced by the lack of indication of review in the following Process Sheets which were being used in the manufacturing process: (1) dated August 6, 1982, for Part No. 20-157, Revision D; and (2) dated September 6, 1980, for Part No. 88-93, Revision C. Also, it was noted that the latter Process Sheet was attached to Drawing No. 88-93, Revision E.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 11.2 of the Quality Assurance Manual, dated April 10, 1979, inspection stamps had not been used to indicate completion of inspection action and acceptance. This was evidenced by: (1) written inspection stamp number on 12 Test Data Sheets, dated January 1981, for Sales Order No. 63479; and (2) no indication of inspection on the Torque Test Sheet, dated October 27, 1981, for Sales Order No. 70265.

ORGANIZATION: RAYMOND CONTROL SYSTEMS
A BRUNSWICK COMPANY
ST. CHARLES, ILLINOIS

REPORT NO.: 99900782/82-01	INSPECTION RESULTS:	PAGE 3 of 4

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 5.1 of the Quality Assurance Manual, dated April 10, 1979, work instructions had not been issued to assure that proper performance of assembly operations had been accomplished.

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 1.1 of Quality Assurance Requirements No. 001, dated May 30, 1978, acceptance of Torque Wrench, Serial No. 2338-4 (0-500 foot-pounds) had not been recorded on a tool inspection card. The torque wrench displayed a current calibration label; however, there was no information to justify affixing the calibration label.

5. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 2.1 of Quality Assurance Requirements No. 001, dated May 30, 1978, certification of calibration of new, replaced, or repaired electrical test equipment, used for acceptance testing of electrical actuators, had not been reviewed for compliance and accuracy prior to its acceptance and usage. This is evidenced by failure to include electrical test equipment in the calibration program.

6. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and the first paragraph of Quality Assurance Requirements No. 001, dated May 30, 1978, the Plug Gauge Set, Serial No. 1334-1 had not been verified periodically to insure its accuracy, as evidenced by the affixed calibration label and tool inspection card which indicated that calibration was due July 9, 1982.

7. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraphs 7.1 and 7.4 of the Quality Assurance Manual, dated April 10, 1979, and corrective action commitments contained in a Raymond Control Systems letter, dated September 16, 1981, the actions to prevent recurrence had not been taken as evidenced by the lack of: (1) documented procedures for accomplishing the tasks; (2) records to substantiate task accomplishment; and (3) documented procedures for controlling crimping tools and scales used in the performance of assuring adequate crimped wire terminations.

C. UNRESOLVED ITEMS:

Paragraphs 4.4 and 5.2 of the Quality Assurance Manual, dated April 10, 1979, indicate, respectively, that: (1) work instructions are reviewed by the

responsible department and quality assurance; and (2) Manufacturing Process Sheets provide authorization for manufacturing and are reviewed prior to release.

Paragraphs 8.1 and 8.2 of the Quality Assurance Manual, indicate, respectively, that: (1) the Engineering Department is responsible for development of drawings and specifications; and (2) drawings shall be prepared and checked. Also, the inspector was informed that the Engineering Department initiates Acceptance Test Procedures.

The inspector reviewed the following forms: (1) Distribution Schedule - Drawing Prints; (2) Engineering Release; and (3) Drawing Revision, Review, and Release Procedure. Additionally, Acceptance Test Procedures were reviewed.

During and subsequent to this review, it was not apparent that individuals responsible for initiating, reviewing, approving, and issuing quality-affecting documents and related changes had been identified.

D. OTHER FINDINGS OR COMMENTS:

Mississippi Power and Light Company's 10 CFR Part 50.55(e) report, dated November 17, 1981, and its attachment 4 (Bechtel Power Corporation's 10 CFR Part 21 report) addressed improperly crimped terminal lugs on electric wiring in actuators manufactured by Raymond Control Systems.

During the inspection, the inspector was informed that the deficiency was confined to the Grand Gulf Nuclear Station, Unit Nos. 1 and 2 and traceable to one individual, who is no longer with the company. In an effort to assess the effectiveness of the corrective actions and preventive measures, the following areas were evaluated: (1) manufacturing process control; (2) change control; (3) corrective action; and (4) control of measuring and test equipment. Additionally, implementation of 10 CFR Part 21 was evaluated, and an initial management meeting was conducted. The findings are identified in paragraphs A, B, and C.

ORGANIZATION: REACTOR CONTROLS, INC.
SAN JOSE, CALIFORNIA

REPORT NO.: 99900529/82-01	INSPECTION DATE(S) 10/12-15/82	INSPECTION ON-SITE HOURS: 23

CORRESPONDENCE ADDRESS: Reactor Controls, Inc.
ATTN: Mr. J. C. Millett
Vice President
1245 S. Winchester Boulevard
San Jose, CA 94070

ORGANIZATIONAL CONTACT: Mr. R. K. Crum, QA Manager
TELEPHONE NUMBER: (408) 246-3801

PRINCIPAL PRODUCT: Control rod drive hydraulic systems and installation of reactor pressure vessel internals.

NUCLEAR INDUSTRY ACTIVITY: Reactor Controls, Inc., (RCI) consists of about 130 employees, 110 of which are located in the San Jose office. RCI is currently performing work on Grand Gulf, Rancho Seco, Shoreham, La Salle, Phipps Bend, Clinton, Nine Mile 2, and Hope Creek.

ASSIGNED INSPECTOR: R. H. Brickley 11/22/82
R. H. Brickley, Reactor Systems Section (RSS) Date

OTHER INSPECTOR(S):

APPROVED BY: C. J. Hale 11/22/82
C. J. Hale, Chief, RSS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21 and 10 CFR Part 50, Appendix B.

B. SCOPE: Inspection made in response to the following: (1) a construction deficiency report from Region II concerning supports installed and accepted by RCI that are not in accordance with approved design; (2) a potential 10 CFR Part 21 submitted by RCI concerning hydrodynamic loads on the control rod drive hydraulic system (CRDHS); and (3) allegations concerning analysis of the CRDHS.

PLANT SITE APPLICABILITY:

Docket Nos. 50-416, 50-417, 50-461, 50-462, 50-410.

ORGANIZATION: REACTOR CONTROLS, INC.
SAN JOSE, CALIFORNIA

REPORT NO.: 99900529/82-01	INSPECTION RESULTS:	PAGE 2 of 5

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Control Rod Drive Hydraulic System (CRDHS) Supports - This item concerns a 10 CFR Part 50.55(e) report submitted to Region II by Mississippi Power & Light Company (Grand Gulf, Units 1 and 2) regarding pipe support installations which were not in accordance with design requirements.

   The NRC inspector examined the records concerning this item consisting of internal and external correspondence, QC Hold Information Reports, and the related drawings and engineering change notices (ECN).

   The examination of RCI records disclosed that the nonconforming supports were identified by RCI site QC personnel during the performance of reinspections of previously accepted supports. All QC holds had been dispositioned to repair the deficiencies and/or a stress reanalysis performed, and ECN's were issued and incorporated into applicable drawings. In addition, site QC personnel have received additional training on the necessity to follow the requirements of their QA procedure for inspections.

   There were no nonconformances or unresolved items identified in this area of the inspection.

2. CRDHS Hydrodynamic Loads - This item concerns a potential 10 CFR Part 21 report made by RCI to the Office of Inspection and Enforcement regarding the results of a CRDHS piping stress analysis for the startup scram condition at Grand Gulf, which indicated that the piping is overstressed by factors as high as six times ASME Code allowables due to pressure peaks and high displacement effects.

ORGANIZATION: REACTOR CONTROLS, INC.
SAN JOSE, CALIFORNIA

REPORT NO.: 99900529/82-01	INSPECTION RESULTS:	PAGE 3 of 5

The NRC inspector examined the records concerning this item consisting of internal and external correspondence, QA instructions, and specifications.

The examination of RCI records disclosed that they had not previously considered hydrodynamic loads resulting from the scram function in their analysis of the CRDHS piping because RCI had not been provided the correct scram valve opening time. RCI had been using a 350 millisecond (msec) opening time for the scram inlet valve, which reportedly produced negligible hydrodynamic loads. This value was obtained from General Electric Specification No. 21A8781 (Control Rod Design and Performance Requirements, Revision 2, dated May 20, 1975) which in Section 5.2.10 stated, "Scram valve time from pilot valve voltage interruption: (see 6.2.3) 100% open - 0.35 sec. max." In performing the stress analysis for Grand Gulf (BWR-6), RCI was specifically requested to consider the hydrodynamic loads of this system for the first time; therefore, requesting confirmation of the valve opening time. The response indicated an opening time of 20 msec; and, upon further inquiry, that this value also applied to earlier units of the BWR. When the hydrodynamic loads using the new value were considered in the analysis, the resultant overstress condition previously mentioned was identified.

Recent data from tests conducted at Grand Gulf during preoperational scram checks indicate that the previous analysis gave results that were approximately 20% higher than the measured peak pressures. Currently, RCI is conducting a reanalysis of the CRDHS on those plants with active contracts consisting of Grand Gulf, Nine Mile Point, Clinton, River Bend, and Hope Creek.

There were no violations, nonconformances, or unresolved items identified in this area of the inspection.

3. Analysis of the CRDHS - This item concerns allegations by an anonymous individual to Region V alleging that: (1) pool swell loads were not analyzed in the manner required by General Electric Containment Report-4 (CLR-4); (2) the control rod insert and withdraw lines were not analyzed for the pipe break condition; (3) "brow beating" analysts to sign computer printouts which represented system problems; (4) stress problems and load reports have no QA standards or controls; and (5) seismic category lines are not being analyzed in the proper fashion.

The NRC inspector examined the records concerning these items consisting of QA instructions, two engineering control checklists, seven analysis

files, two design analysis outlines, two computer program verification files, and two specifications. In addition, the NRC inspector privately interviewed five randomly-selected individuals involved in the performance/checking of CRDHS analyses.

a. Allegation No. 1 - "The pool swell loads have been made static equivalent loads for analysis, instead of being done correctly per CLR-4, which says they must be analyzed by time history method."

This allegation could not be substantiated. The examination of records and discussions with RCI representatives did not disclose any reference to or knowledge of document CLR-4 or the requirement to use the time history method in the analysis.

Subsequent to the inspection, the inspector identified CLR-4 as a General Electric document titled, "Containment Load Report," Revision 4, dated January 1980. A review of Revision 3 to this document and discussions with GE representatives failed to disclose any requirement that pool swell loads had to be analyzed by the time history method or that the time history method was a more conservative or correct analytical method.

b. Allegation No. 2 - "Pipe break for the high pressure control rod insert and withdraw lines were ignored even though they were covered under 'Design Analysis Outline' from Sargent & Lundy for high energy criteria."

This allegation could not be substantiated. The examination of the design analysis outline for Clinton, Unit 1 (SA-463-DA0), that had been reviewed and accepted by Sargent & Lundy, disclosed that piping and branch connections equal to or less than a nominal pipe size (NPS) of 1-¼" were excluded from high energy pipe rupture analysis. The same exclusion was found in Bechtel Specification 9645-M-316.0 and the FSAR for Grand Gulf. The insert line is 1-¼" and the withdraw line is 1" NPS; and, thus, are excluded from the analysis.

c. Allegation No. 3 - "The brow beating of analysts to sign computer print-outs, which represent system problems . . . Any checker not rubber stamping printout -, 'Problems,' are either layed-off or transferred to some other work."

This allegation could not be substantiated. The private interviews with five randomly-selected individuals involved in the performance/checking of CRDHS analysis did not disclose any feeling of "brow beating" or that they felt threatened in any way by management.

ORGANIZATION: REACTOR CONTROLS, INC.
SAN JOSE, CALIFORNIA

REPORT NO.: 99900529/82-01	INSPECTION RESULTS:	PAGE 5 of 5

d. Allegation No. 4 - "The stress problems have no quality assurance standards incorporated in the organization of information, to print-out, to report. There are no titles, table of contents, check-lists, signoff sheets, assumptions, stress or load summaries or any attempt to organize analysis into any coherent definition of problems. . . No QA controls of reports, contents, organization, or procedures exist, or is apparent."

This allegation could not be substantiated. The examination of QA instructions, project instructions, and seven analysis files disclosed that the alleged items were adequately addressed and were being implemented.

e. Allegation No. 5 - "The seismic category 1 over 2 lines are not being analysed (sic), or even being considered in the proper fashion."

This allegation could not be substantiated. The examination of client specifications and analysis files did not disclose any deficient areas.

ORGANIZATION: RIDIHALGH, EGGERS, AND ASSOCIATES
COLUMBUS, OHIO

REPORT NO.: 99900794/82-01	INSPECTION DATE(S) 10/4-5/82	INSPECTION ON-SITE HOURS: 24

CORRESPONDENCE ADDRESS: Ridihalgh, Eggers, and Associates
ATTN: Mr. P. E. Eggers
Vice President
2219 Summit Street
Columbus, Ohio 43201

ORGANIZATIONAL CONTACT: Mr. J. Adams, Quality Assurance Manager
TELEPHONE NUMBER: (614) 267-6522

PRINCIPAL PRODUCT: Independent Spent Fuel Storage Cask Design

NUCLEAR INDUSTRY ACTIVITY: Independent spent fuel storage cask design and other casks for transportation purposes.

ASSIGNED INSPECTOR: Wm. M. McNeill — 11/8/82
Wm. M. McNeill, Reactive and Component Program Section (R&CPS) — Date

OTHER INSPECTOR(S): P. Sakowski, Reactor Systems Section

APPROVED BY: I. Barnes — 11/8/82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: Ridihalgh, Eggers, and Associates Quality Assurance Plan, REA 2023, Chapter 11, dated May 6, 1982.

B. SCOPE: Design control and procurement document controls.

PLANT SITE APPLICABILITY:

Not identified.

ORGANIZATION: RIDIHALGH, EGGERS, AND ASSOCIATES
COLUMBUS, OHIO

REPORT NO.: 99900794/82-01	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Section V of the Ridihalgh, Eggers, and Associates (REA) Topical Report and the design control procedure QAP 06.2, the design control procedure was found not to be fully implemented, as evidenced by: (a) design control checklists had not been used in the design reviews performed to date on the REA 2023 independent spent fuel storage cask design; (b) logs were not fully maintained in that five of the seven weight calculations and the 30-foot drop calculations had not been entered; and (c) although shielding calculations for the REA 2023 were signed in the logs, the design review, in fact, had not been performed.

2. Contrary to Section V of the REA Topical Report and Section 03.1 of the REA QA manual, paragraph 3.1, the reviewing, checking, reevaluating, and verifying process for the REA 2023 design did not appear to be fully structured and planned, as evidenced by fabrication having been permitted to start on the REA cask without verification of the adequacy of the last 12 structural calculations which dated back as far as February 25, 1982.

3. Contrary to Section V of the Topical Report, the Introduction of the Topical Report, and the customer contract design criteria, necessary actions were not taken to provide confidence that the cask meets the shielding design criteria, as evidenced by the identification by the NRC inspectors that shielding calculations had failed to take into account a void that would be present after filling of the neutron shield water jacket. The presence of this void would allow a dose rate greater than the design criteria of 20 MR.

4. Contrary to Section V of the REA Topical Report and Section IV of the Topical Report, the REA procurement documents to its supplier, Brooks and Perkins, for the REA 2023 cask did not contain or reference the appropriate design bases such as the design drawings, or the specifications referenced on the drawings.

ORGANIZATION: RIDIHALGH, EGGERS, AND ASSOCIATES
COLUMBUS, OHIO

REPORT NO.: 99900794/82-01	INSPECTION RESULTS:	PAGE 3 of 4

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Design Controls

a. Basic Design - The customer contract was reviewed and its five modifications to date. The 17 design drawings for the REA 2023 cask were reviewed in order to establish the design base. The design calculations of shielding, 30-foot drop capability, and weight were reviewed indepth. Weight, dimensional envelope, seismic load, 30-foot drop capability, 20 MR max surface dose rate, and a service life of 50 years are basically the only technical requirements defined by the customer. It was observed that the customer failed to identify significant parameters such as the burn-up characteristics of the fuel and the spectrum of seismic loads for design purposes. The following examples of changes from the proposal which had been part of the purchase specification were noted:

(1) An increase in overall dimensions of 87.0" to 87.56" in the diameter and 192.37" to 192.62" in the length;

(2) a decrease in the lead shield from 4½" to 4¼";

(3) one less penetration for temperature measuring devices; and

(4) a change in bolting material for the cover from SA-325 to SA-193.

b. Design Activities - Design controls have been established in procedure QAP 06.2. A number of failures to fully implement this procedure were identified and this has been documented as nonconformance B.1 above. The review and approval of drawings were found to follow the established procedure. A tracing log was maintained and drawings were given "Document Control" numbers and logged in the print distribution log. Release of drawings for fabrication was documented on a drawing release approval form. Fabrication has begun, yet the application or Safety Analysis Report has yet to be submitted to the NRC as of this report. Further, the design review effort was found to be lagging the design effort and has been identified as nonconformance B.2 above.

ORGANIZATION: RIDIHALGH, EGGERS, AND ASSOCIATES
COLUMBUS, OHIO

REPORT NO.: 99900794/82-01	INSPECTION RESULTS:	PAGE 4 of 4

c. Unresolved Design Problem - During the design review by the NRC inspectors, it was noted that there was an unresolved shielding design problem which has been identified as noncomformance B.3, above. It appears that this problem resulted from a breakdown in design interfaces and communication. The cask is designed with a water jacket tank which functions as a neutron shield. The fill ports have a ¼" internal boss which allows filling in a vertical position to its full length less ¼". The storage position for these casks is designed to be horizontal, which allows the ¼" vertical bubble or void to become a horizontal void or bubble along the length of the neutron shield. It appears that the resulting reduction of the neutron shield thickness from the design valve of 6 inches would then allow a greater than 20 MR dose rate. REA roughly estimated the resultant of this shield loss of a ¼" (vertical) would be a 6° window the length of the tank with a maximum 23 MR dose rate at the thinnest thickness when the cask is horizontal.

It was further noted that to allow for thermal expansion the weight calculations were based on a fill factor of 95% or 90% which would mean approximately a 7½" or 15" vertical void or bubble and even further loss of shielding. The NRC inspectors also questioned if the effects of environmental temperatures had been accounted for in the shielding design. In general, it was noted that the REA 2023 design had not been finalized. Fabrication has begun, yet design aspects such as trunnion design, expansion tanks, over fill tanks, environmental temperature effects, etc., had not been fully resolved.

2. Procurement Document Controls - The purchase order to its subvendor, Brooks and Perkins (B&P), was inspected. This purchase order identified REA's customer specification; however, it did not identify the design drawings, nor the specifications referenced on the drawings. It was noted that the specifications on welding, leak testing, packaging, etc., were only in a draft form. This has been identified as nonconformance B.3. REA has audited B&P and qualified them as a supplier.

It was noted by the NRC inspectors that procurement request forms were not being used by REA. This problem has been identified by an internal audit dated August 9, 1982. Corrective action had yet to be established and implemented by REA.

ORGANIZATION: THE ROCKBESTOS COMPANY
A MEMBER OF THE MARMON GROUP
WALLINGFORD, CONNECTICUT (E. GRANBY PLANT)

REPORT NO.: 99900277/82-02	INSPECTION DATE(S) 5/3, 4, 24-28/82	INSPECTION ON-SITE HOURS: 100

CORRESPONDENCE ADDRESS: The Rockbestos Company
A Member of The Marmon Group
ATTN: Mr. E. S. Reed, Vice President-General Manager
P. O. Box 778
Wallingford, CT 06492

ORGANIZATIONAL CONTACT: Mr. G. G. Littlehales, Manager-Quality Assurance
TELEPHONE NUMBER: (203) 265-6500

PRINCIPAL PRODUCT: Insulated Wire and Cable.

NUCLEAR INDUSTRY ACTIVITY: 75 percent.

ASSIGNED INSPECTOR: W. E. Foster
W. E. Foster, Reactive & Component Program Section (R&CPS) — Date: 9/16/82

OTHER INSPECTOR(S): I. Barnes, Chief, R&CPS
L. E. Ellershaw, R&CPS; L. B. Parker, R&CPS
J. A. Murphy, E. D. Eich (Consultants)

APPROVED BY: I. Barnes
I. Barnes, Chief, R&CPS — Date: 9-16-82

INSPECTION BASES AND SCOPE:

A. BASES: Appendix B of 10 CFR Part 50.

B. SCOPE: This inspection was conducted as a result of the receipt by the Nuclear Regulatory Commission of allegations pertaining to implementation and enforcement of the Rockbestos quality assurance program and was performed in conjunction with an investigation by the Region IV Investigation and Enforcement Staff. Investigative findings are contained in Report
(cont. on next page)

PLANT SITE APPLICABILITY:

Dockets: 50-412; 50-322; 50-454/455; 50-443/444; and 50-508, and 50-440/441.

ORGANIZATION: THE ROCKBESTOS COMPANY
A MEMBER OF THE MARMON GROUP
WALLINGFORD, CONNECTICUT (E. GRANBY PLANT)

REPORT NO.: 99900277/82-02	INSPECTION RESULTS:	PAGE 2 of 8

SCOPE: No. 99900277/82-01. The main purposes of the inspection were to evaluate identified concerns and to establish whether product verification activities were consistent with applicable codes, contractual and regulatory requirements. To make this determination, the primary areas selected for inspection were manufacturing process control, equipment calibration, test control, shelf life of jacket materials, nonconformances and corrective action, and audits. In addition to the above, a followup inspection was also made in regard to a potential 10 CFR Part 21 report by Rockbestos pertaining to deformation of conductor insulation caused by improper adjustment of printing equipment.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 4.2 of Section 4, dated April 15, 1981, of the Quality Manual, customer procurement document requirements had not been translated into Manufacturing Specifications (MIT's) relative to tests specified in Commonwealth Edison Company Purchase Order No. 258936, dated November 16, 1981.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraph III and its subparagraphs 1 through 4 of Quality Procedure No. Q-9, Revision 6, dated December 8, 1981:

   a. The Extrusion Process Chart - KXL760G-16, dated January 15, 1982, in use at Extruder Machine No. 800, did not contain identification of the individuals who had prepared, reviewed and/or approved, and issued the document. This document reflected criteria for controlling the process.

   b. Engineering Process Instructions - 1 MEV (805), dated January 25, 1982, in use at Irradiation Machine No. 805, did not contain identification of the individuals who had made, reviewed and/or approved the additional handwritten information reflected therein. This document exhibited criteria for controlling the process.

ORGANIZATION: THE ROCKBESTOS COMPANY
A MEMBER OF THE MARMON GROUP
WALLINGFORD, CONNECTICUT (E. GRANBY PLANT)

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3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 6.1 of Section 6, dated February 1, 1981, of the Quality Manual, extrusion of insulation onto conductors, Reel Nos. 43487, 8, 9 and 43490, was not being accomplished in accordance with Extrusion Process Chart-KXL760G-16, dated January 15, 1982. The actual temperatures being recorded were outside the requirements specified in the Extrusion Process Chart. Examples are as follows:

LOCATION	REQUIRED	ACTUAL	LOCATION	REQUIRED	ACTUAL
Z1	340±10°F	326	Z5	340±10°F	380
Z2	380±10°F	347	D1	350±10°F	371
Z3	340±10°F	358	D2	380±10°F	399

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraph III and its subparagraph 7 of Quality Procedure No. Q-9, Revision 6 dated December 8, 1981, Product Specifications for extruding and irradiating did not specify the documents (Extrusion Process Chart and Engineering Process Instructions, respectively) being used to perform the activity.

5. Contrary to Criterion V of Appendix B to 10 CFR Part 50, QA Manual Section 13, and Quality Procedure Q-3, the following conditions were identified:

   a. Records of calibrations have not been maintained for the 1 MEV and .5 MEV irradiation units. The available records showed the earliest calibration of the instruments as follows:

	1 MEV Unit	.5 MEV Unit
Beam Current Meter	5/23/81	6/5/81
High Voltage Meter	6/15/81	7/20/81
Feet per Minute Meter	11/3/81	10/2/80

   The 1 MEV and .5 MEV units have been operational since December 1976, and June 1980, respectively.

   b. The calibration records for the spark tester KV meter on the 1 MEV unit showed that it was last calibrated on August 16, 1980, with a due date of August 1981. Records did not indicate that the instrument had been calibrated on an annual basis.

6. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and QA Manual Section 12, the Gravimetric Method of Accelerated Water Absorption Tests, required by certain TDB's, were not performed in accordance with I(P)CEA Standard S-19-81 in that:

ORGANIZATION: THE ROCKBESTOS COMPANY
A MEMBER OF THE MARMON GROUP
WALLINGFORD, CONNECTICUT (E. GRANBY PLANT)

REPORT NO.: 99900277/82-02	INSPECTION RESULTS:	PAGE 4 of 8

a. The TDB's did not address the use of a vacuum oven, and they required a temperature of 75°C which is in excess of the required IPCEA 70°±1°C.

b. Observation of in-process Gravimetric Method Tests showed that the vacuum oven was not being used, the controller to the oven being used was set at 75° C while the temperature recording chart was reading 80° C, and the water levels were down by as much as 3 inches from the undersurface of the covers.

7. Contrary to Criterion V of Appendix B to 10 CFR Part 50, QA Manual Section 12, and Stone & Webster Engineering Corporation Purchase Order specification, review of TDB 324N for SO 14602-01 (Beaver Valley Power Station, Unit 2) which addresses hypalon jacket testing, revealed the following:

a. The tear test failed to meet the required 30 lbs/in. minimum (28) and slab data value of 49 was entered on the TDB in lieu of the required retests. Further, there are no documented means to assure that the first set of six specimens were actually tested.

b. The elongation of the air oven aged specimen, expressed as a percentage of the original, failed to meet the required 65% minimum. A slab data value of 90% was entered in lieu of the required retests.

c. A duplicate TDB was generated which showed the slab data, but it was not identified as being slab data.

8. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 12.3 in Section 12 of the QA Manual:

a. The Test Data Sheet for Shop Order No. 43327-18 (Shoreham Unit 1, 1/c No. 18 AWG coaxial cable) did not contain instructions which would provide for performance of insulation resistance, oxygen index and copper mirror corrosion tests in accordance with order requirements.

b. Rockbestos' evaluation of test results for the above Shop Order did not assure that test requirements had been satisfied, as evidenced by:

(1) The failure to identify that an incorrect test voltage had been used for performance of insulation resistance testing;

(2) The failure to identify that the number of oxygen index tests required by the applicable specification, ASTM D 2863, had not been performed and reported; and

(3) The failure to identify that a Copper Mirror Corrosion Test had been performed for a test duration of 18 hours, and not the 16-hour test period stipulated by the applicable Stone and Webster specification, SNI-129, Revision 2.

9. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Internal Memoranda dated September 5, 1978 and September 29, 1981, there are numerous examples of alterations to test results on TDBs by use of "white-out," rather than the required single line drawn through the data with the initials of the person performing the changes.

10. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and QA Manual Section 16, supplementary information such as speed (feet per minute) and milliamps, was not recorded when the disposition "rebeam" was entered on OSR No. 48154 dated May 20, 1982. This OSR was generated as a result of physical test failure after irradiation had been performed on 34,500 feet of conductor from reel number 41445. The "rebeam" operation was in-process when this condition was identified by the NRC inspector.

11. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Quality Procedure Q-13, paragraph 5, the individual(s) responsible for corrective action on Corrective Action Reports QC44EG, QC45EG, and QC46EG did not respond within the required 30-day period.

12. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Quality Procedure Q-5, paragraph D.1, the yellow and white copies of the OSR 56420 had been dispositioned, and the green and manila copies, which were attached to the cable did not indicate any disposition.

13. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Quality Procedure Q-5, paragraph E.1, OSR's 48159, 56721 and 56337 had the "quantities" section filled in on the green copy, but the green copy had not been inserted in the OSR board with its yellow copy.

14. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Quality Procedure Q-5, paragraph E.4 note: (1) OSR's 48156, 48159, 56299, 56337, and 56721 have multiple dispositions (some initialled, some not initialled) which leaves the actual disposition of the non-conforming cable questionable; and (2) also on OSR 48159 the amount of cable rejected (2558 feet) does not agree with the actual "quantities" dispositioned (1500 feet).

C. UNRESOLVED ITEMS:

1. Insulation Resistance Tests are conducted on completed cable after the cable has been immersed in water for a period of six hours. There is no requirement to record the time of immersion and the time of test. Consequently, the inspector could not determine that the test had been conducted after the cable had been immersed for six hours.

2. The inspector observed the brazing of conductors in the Stranding Area and noted that the operator measured the conductor of the replacement reel prior to brazing to the conductor of the depleted reel. The brazed area was filed and checked with the fingers; however, it was not apparent that the area was subjected to measurement or a visual inspection or that a procedure existed for accomplishing the task.

3. Validity of performing primary insulation retests for accelerated water absorption (IPCEA S-66-524, EM-60 Electrical Method) and flammability (UL 83, Vertical VW-1) properties, after initial failing test results have been obtained.

   Review of primary insulation test data indicated instances where initial EM-60 test results did not meet the requirements listed in the Test Data Sheets. Retests were documented as having been performed and which indicated compliance with the Test Data Sheet requirements. Examination of the IPCEA standard showed, however, no provisions or criteria for performance of retests for this specific test. Similarly, one instance was observed where a UL83, Vertical VW-1 flammability test failed the criteria for flame-out time and burning of indicator on initial test. A retest was identified as having been performed with the results showing compliance with the listed requirements. Examination of the UL 83 specification also showed no retest provisions for this test.

D. OTHER FINDINGS OR COMMENTS:

1. During the manufacturing process control aspect of this activity, the inspector examined: (1) 9 sections of the Quality Manual; (2) 7 manufacturing specifications; (3) 5 quality procedures; (4) 4 bare copper bills of material; (5) 2 purchase orders; (6) 2 certified test reports; (7) 2 extrusion process charts; (8) 10 labor report tickets-test department; and (9) 1 each (a) manufacturing procedure; (b) final inspection data; (c) test procedure; (d) certificate of conformance; and (e) engineering process instruction. Also, hardware processing was observed at 13 work stations.

   As a result of this review, nonconformance items B.1, 2, 3, and 4 and unresolved items C.1, and 2 were identified.

2. Equipment Calibration - This subject was inspected by review of the Quality Program requirements, including the QA Manual, applicable quality and calibration procedures, calibration reports, qualifications of the outside calibration subcontractors, and observation of laboratory equipment, irradiation units, primary standards, spark testing equipment and mechanical measuring devices.

   As a result of this review, nonconformance item B.5 was identified.

3. Test Control - This subject was inspected by review of the Quality Program requirements, including the QA Manual, applicable quality procedures, customer requirements, laboratory test data sheets, and observation of in-process electrical and physical testing in the laboratory.

   Flame testing was not observed during this inspection; however, a review of the associated documentation was conducted. The Underwriter Laboratory Standard UL-44 states in part, " . . . the test(s) are to be conducted under a forced-draft exhaust hood or cabinet operating to provide removal of smoke and fumes, but avoiding drafts that affect the flame." Review of data and discussion with the QC Manager revealed that the method used by Rockbestos does not provide a static air flow condition throughout the chamber; however, there is a static air flow condition at the point of flame impingement.

It should be noted that Rockbestos did not have procedures which address the various tests performed by laboratory technicians. Rather, they use the specific standards which are contractually imposed; e.g., IPCEA, Underwriter Laboratory, and ASTM Standards.

Nonconformance items B.6, B.7, B.8, and B.9 and unresolved item C.3 were identified during this review.

4. Shelf Life of Jacket Materials (Neoprene and Hypalon) - These materials are provided with a manufacturer's shelf life, the date by which the material must be used in order for it to be extrudable. Rockbestos, in turn, establishes a shelf life which is more conservative than the manufacturer's, in an attempt to preclude an excess amount of material from becoming unuseable.

   There are times when the shelf life established by Rockbestos is exceeded. The NRC inspector observed some boxes of material which had exceeded the shelf life; however, the material was tagged with an Off-Standard Report. This material would not be used until a sample was extruded in order to determine its suitability. The ability to process an acceptable extrusion has a direct relationship to the shelf life, thus, if the material actually exceeds its shelf life, it will not extrude.

5. Nonconformances and Corrective Action - The OSR System Report for East Granby was examined and 15 OSR's were chosen from the report for examination in detail. The OSR's were chosen from several different departmental codes, with varying "Defect Descriptions," and "Disposition Instructions." Examination of these OSR's and their execution with respect to procedure requirements revealed that East Granby personnel were not following procedures which implemented their nonconformances and corrective actions. See nonconformances B.10 through B.14.

6. Audits - The program implementation of QA Manual Section 19 was evaluated. Ten internal audit reports, and the 1981 and 1982 internal audit schedules were examined and found to be in compliance with the requirements of Section 19.

7. Followup Inspection on Potential 10 CFR Part 21 Report - A potential 10 CFR Part 21 report was filed by the Rockbestos Company regarding two conductor shielded instrumentation cables shipped to WPPSS Nuclear Project 3 under Contract No. 3240-62B. The cable contained points of deformation in the conductor insulation which caused wall thickness at these points to fall below the specification minimum. This deformation was caused by improper adjustment of printing equipment during application of identification printing to overall cable jacket. The Rockbestos Company is presently evaluating this deficiency and has taken measures to correct and prevent recurrence of the problem.

ORGANIZATION: THE ROCKBESTOS COMPANY
NEW HAVEN, CONNECTICUT

REPORT NO.: 99900277/82-03	INSPECTION DATE(S) 8/16-20/82	INSPECTION ON-SITE HOURS: 80

CORRESPONDENCE ADDRESS: The Rockbestos Company
A Member of the Marmon Group
ATTN: Mr. E. S. Reed, Vice Pres. and Gen. Mgr.
P. O. Box 778
Wallingford, CT 06492

ORGANIZATIONAL CONTACT: Mr. G. G. Littlehales, Manager, Quality Assurance
TELEPHONE NUMBER: (203) 265-6500

PRINCIPAL PRODUCT: Insulated wire and cable.

NUCLEAR INDUSTRY ACTIVITY: Manufacturing operations of nuclear products are being transferred to the East Granby, Connecticut, and Troutman, North Carolina, facilities. However, it is expected that limited activities will continue at the New Haven facility where the current activity is about two percent.

ASSIGNED INSPECTOR: I. Barnes for W. E. Foster, Reactive and Component Program Section (R&CPS) 10-21-81 Date

OTHER INSPECTOR(S): L. E. Ellershaw, R&CPS
L. B. Parker, R&CPS

APPROVED BY: I. Barnes 10-21-82
I. Barnes, Chief, R&CPS Date

INSPECTION BASES AND SCOPE:

A. BASES: Appendix B to 10 CFR Part 50 and 10 CFR Part 21.

B. SCOPE: Inadequacies detected during the investigation and inspection at the East Granby facility indicated that a followup inspection was warranted at the New Haven facility. Inspection areas selected to evaluate the integrity of the QA program were: (1) audits; (2) change control; (3) control of
(cont. on next page)

PLANT SITE APPLICABILITY:

Docket Nos. 50-412; 50-322; 50-454/455; 50-443/444; 50-508; 50-440/441; 50-220; 50-513; 50-277; 50-335; 50-389.

ORGANIZATION: THE ROCKBESTOS COMPANY
NEW HAVEN, CONNECTICUT

REPORT NO.: 99900277/82-03	INSPECTION RESULTS:	PAGE 2 of 8

SCOPE: (Cont.) measuring and test equipment; (4) control of nonconformances and corrective action; (5) manufacturing process control; and (6) quality assurance records. Additionally, followup was conducted on: (1) a violation; (2) a nonconformance; and (3) two followup items.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraph II.3 and its subparagraphs of Quality Procedure No. Q-30, Revision 1, dated August 28, 1979, followup of internal audit deficiencies had not been conducted within 30 days for: (1) Report No. 81-4, dated January 31, 1981, an extension for corrective action was granted on June 19, 1981, for completion on July 1, 1981, while the final completion was dated February 9, 1982; (2) Report No. 81-9, dated June 30, 1981, indicates that confirmation of corrective action will be accomplished in September 1981, but was not accomplished until October 29, 1981; (3) Report No. 81-10 is dated July 28, 1981, while the corrective action response for Deficiency No. 3 is dated October 2, 1981; and (4) Report No. 82-8 is dated April 30, 1982, shows a June 14, 1982, response for Deficiency No. 3. Unless otherwise noted, the reports and accompanying documentation did not address dates of completion and/or extension.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraphs 16.2.2.3.1 and 16.2.1.3 of Section 16, dated February 1, 1981, of the Quality Manual, accomplishment of disposition instructions had not been made on Off-Standard Report (OSR) copies nor had the copies been collated to ensure that the indicated disposition had been made. This was evidenced by a single uninitialed white copy of the following OSR's in the closed file: Nos. 50613, dated July 1, 1982; 50765, 50766, 50767, and 50967, all dated August 10, 1982.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 5 of Quality Procedure No. Q-13, Revision 4, dated April 4, 1982, and Revision 3, responses had not been submitted within 30 days of the report date and a corrective action commitment had not been obtained prior to the due date for the following corrective action reports: (1) 82-NH-1001, dated March 16, 1982, response dated May 21, 1982; (2) 82-NH-1004, dated June 2, 1982, response dated July 16, 1982; and (3) 82-NH-1005, dated June 2, 1982, response dated July 16, 1982. Extension of time to submit responses to report numbers 1004 and 1005 was granted on July 15, 1982.

4. Contrary to paragraph III and its subparagraphs 1, 2, 3, and 4 of Written Standard Practice No. G-33, dated September 29, 1978, identification of the individuals preparing, reviewing, and approving the following revised pages had not been indicated by signatures or initials: (1) Part D2-Page 1.500, Issue E, dated March 30, 1981; (2) Part D3-Page 5.3, Issue C, dated June 19, 1980, Page 5.8, Issue E, dated March 30, 1981, Page 5.801, Issue E, dated June 16, 1980, Page 6.1, Issue T, dated June 12, 1979; (3) Part D100-Pages 3.0 and 3.1, Issue A, dated December 7, 1978; and (5) Part M4-Page 2.30, Issue E, dated September 10, 1980, Page 2.31, Issue H, dated September 30, 1980.

5. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Quality Manual Section 13:

   1. Calibration records had not been maintained as evidenced by different calibration dates in the records and equipment labels. Examples:

Spark Tester No.	Calibration Label Date	Calibration Record Date
57	July 1982	February 1981
109	August 29, 1981	February 1981
41	August 1981	February 1981
62	August 1981	February 1981
51	August 1981	February 1981
64	August 1981	February 1981

   2. Spark Tester No. 16 was overdue and being used without having been recalibrated. The label and record showed a date of July 1981.

6. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Quality Procedure Q-19, observation of six laboratory aging ovens and the multipoint temperature recorder revealed that the equipment was not in good working condition, thus laboratory personnel could not ascertain whether temperatures were controlled within ± 1° C.

7. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Quality Manual Sections 4 and 6, there are no documented procedures or instructions to assure that a specific operation (ovenize at 180° F for 12 hours) had been accomplished. The following observations were made on August 19, 1982, at 2:00 pm (1400 hours) which, if a procedure had been available, would have been precluded:

1. An undocumented form called a Curing Time Log was attached to the front of Oven No. 4. This log stated the contents in the oven were: "Shop Order 21601-02, Product Code S14-3031, Item No. 2, Pair Nos. 8 through 13, Date In (8/18-12 hours), Date Out (8/18-2400 hours)."

   The actual contents of the oven consisted of 6 reels on Shop Order 21518-04 (WPPSS). (NOTE: According to the Curing Time Log, Shop Order 21601-02 was not scheduled to have been removed yet.)

2. The time and temperature recorder was not operating.

3. The NRC inspector checked the oven air and material temperatures with a portable, digital temperature probe and noted the following: air temperature, 174° F-188° F; material temperature, 150° F.

8. Contrary to Criterion XI of Appendix B to 10 CFR Part 50, there are no provisions to assure that prerequisites, such as number of hours at specified aging temperatures for insulation, silicone, and hypalon jackets, prior to physical tests, have been met. Certain aging tests require as many as 168 hours at temperature. There are no formal, documented means to show when samples are placed in or removed from ovens.

9. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraphs 4.2.1 and 4.2.2 of Section 4, dated April 15, 1981, of the Quality Manual, and other quality program requirements:

   a. Zone temperature values had not been included in the Technical Instruction Sheet (TIS) section of the Manufacturing Instruction Tag (MIT) for Product Code (PC) IEA-1124 through 1131 for setting up machine No. 209, an insulated wire extruding machine. Also, there were no process control procedures available to the machine operator.

   b. The transmission ratio and rate of feed for machine No. 135A had not been set to the values identified in the TIS section, Revision B, dated July 9, 1982, of the MIT for Shop Order (SO) No. 21518-03, PC IEE-0341. The NRC inspector observed that the ratio was 3.03 and the rate was 33 feet per minute (fpm) as opposed to the required values of 4.01 and 38 fpm, respectively.

c. Machine No. 261A was not being operated at the rate of speed (38 fpm) required by the TIS section, Revision A, dated July 1, 1982, of the MIT for SO No. 21518-03, PC I46-5237. The NRC inspector observed that the rate was 30 fpm.

d. An acetylene torch and silver solder had not been used to braze the two tape ends as required by the TIS section, Revision A, dated July 1, 1982, of the MIT for SO No. 21518-03, PC I46-5237. The NRC inspector observed that an electric soldering iron and rosin core solder were used to splice the copper tape.

10. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and Quality Procedure No. Q-9, Revision 7, dated June 7, 1982, the TIS section of the MIT for SO 21518-03, PC I46-5237, Revision A, dated July 1, 1982, was identified incorrectly as follows: sheet 2, PC I46-5236, Revision B, dated July 1, 1982, and sheets 3 and 4 were PC I46-5236, Revision A, dated July 1, 1982.

11. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and Quality Procedure No. Q-5, Revision 10, dated May 20, 1982, the white copy of OSR 52368, which was written and dispositioned on August 12, 1982, was voided on August 16, 1982, without forwarding the white copy to the Supervisor of In-process Inspection.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Violation(81-01) - Posting of Part 21 and Section 206 at 195 Church Street, New Haven, Connecticut. Posting was accomplished and observed during 81-01 inspection. However, Rockbestos had moved the 195 Church Street location to Wallingford, Connecticut, in January 1982.

2. (Closed) Nonconformance (81-01) - Failure to file TVA Nonconformance Report in accordance with contract 80KS-825730. Rockbestos transmitted required TVA nonconformance report on October 12, 1981.

3. (Closed) Followup item (81-01) - Potential 10 CFR Part 21 report by Rockbestos concerning Shoreham Nuclear Power Station cable which had indentations in the insulation. Rockbestos had evaluated the Shoreham

cable problem and submitted their report QR No. 2807 to Stone and Webster Engineering Corporation (SWC). SWC approved this report on May 19, 1982. Other purchasers of the product were notified of the problem. They were Philadelphia Electric Co. (Peach Bottom, Unit 2) and Ebasco Services, Inc., Jensen Beach, Florida (St. Lucie Plant).

4. (Open) Followup item (81-01) - Evaluation of the original qualification testing of the RSS-6-100 series coaxial cable was not accomplished during this inspection.

E. OTHER FINDINGS OR COMMENTS:

Inadequacies detected during the investigation and inspection (Report Nos. 99900277/82-01 and 82-02) at the East Granby facility indicated that an inspection was warranted at the New Haven facility. A portion of the inspection was accomplished at the Wallingford facility.

1. Audits, Change Control, Corrective Action, and Nonconformances - This phase of the inspection was accomplished by reviewing the following documents, and verifying their implementation, on a sample basis: (1) 6 sections of the quality manual; (2) 14 procedures; (3) 3 auditor training sheets; (4) 2 audit schedules; (5) 10 audit reports; (6) 26 off-standard reports; (7) 24 reports on nonreceipt of material certifications; (8) 2 reports of faulty material; (9) 24 sheets of the incoming material log; (10) 4 corrective action reports; (11) 2 Rockbestos Customer Product Designs; (12) standard engineering manual; (13) a change order form; (14) 90 sheets in the implementation of specification change file; and (15) 7 purchasing specifications. Nonconformances detected during this effort are identified in paragraphs B.1 through B.4.

2. Equipment Calibration - This area of the inspection was conducted by observation of laboratory test equipment, aging ovens, time/temperature recorders, measuring equipment, spark testers, and review of the applicable calibration records. As a result of this review, nonconformances B.5 and B.6 were identified.

Regarding nonconformance B.6, the following observations were made:

Oven No. and Requirement	Temperature Recorder Shows (C°)
15 (Insulation Aging-158° C)	250° F (121° C)
16 (Insulation Aging-121° C)	275° F (135° C)
17 (Silicone Aging-136° C)	300° F (149° C)
20 (Silicone Aging-199° C-204° C)	415° F (213° C)
21 (Silicone Aging 210° C)	100° F (38° C)

There are approximately 10-12 ovens connected to this recorder, making it impossible to identify the oven number with its associated, recorded temperature because of the nearness of some of the temperatures. The NRC inspector verified, by reviewing preceding recordings, that this condition has existed for some time, and expressed concern over the apparent lack of controls regarding temperature monitoring.

3. Quality Assurance Records - This area of the inspection was conducted by review of 75 Test Data Report packages and supporting documentation related to inprocess testing of conductors, insulation, and jackets. The review consisted of assuring that the required tests were conducted and the results were within the acceptance parameters as stipulated by the IPCEA standards. As a result of this review, nonconformance B.8 was identified.

   As stated in the nonconformance, there are no formal means to document the actual time at temperature for aging test specimens. Usually, the laboratory technician responsible for placing the test specimens in the ovens, records the date the test specimens are due out on a day calendar or on the Test Data Report. However, in some instances it is not recorded anywhere and memory is relied on. In any event, even if the date is recorded, there is still no assurance that the required number of hours has been complied with.

4. Manufacturing Process Control - Quality Manual Section 4 issued on April 15, 1981, "Design Control" was examined. Section 4 establishes the MIT as the manufacturing process control document. Each MIT had an attached bill of material (BOM) and a tag for product identification. Twenty MIT's, two contracts, and the manufacturing process at three cable machine stations were examined.

   Contractual requirements were examined as follows: (1) the use of polyvinyl chloride jacketing was questioned, and a review of Ebasco specification (3240-628) and correspondence verified the acceptance of this material for certain applications; and (2) the incorporation of a proper insulation resistance (IR) constant for Niagara Mohawk Power Requisition Number 843100 (Nine Mile Point No. 1) was questioned, and the Senior Specifications Engineer demonstrated that the MIT IR value had been properly derived using calculations in accordance with IPCEA standards.

ORGANIZATION: THE ROCKBESTOS COMPANY
NEW HAVEN, CONNECTICUT

REPORT NO.: 99900277/82-03	INSPECTION RESULTS:	PAGE 8 of 8

Control of cable manufacturing machine operation in accordance with MIT instructions was examined at machine stations 209, 135A, and 261A. Machine No. 209 was an extruding machine and was undergoing repair when observed, however, nonconformance B.9a was identified. Machine No. 135A, a cable twisting machine was in operation, producing PC IEE-0341 cable and nonconformance B.9b was identified. Machine No. 261A, another (larger than 135A) cable twisting machine was in operation producing PC I46-5237 (WPPSS SO 21518-03) cable and nonconformance B.9c was identified. During observation of 261A machine operation, the copper tape, used as an electrical shield, required splicing; the material and equipment used to perform this splice resulted in nonconformance B.9d. being identified.

One MIT operation for PC IEE-0341 cable required ovenizing of the product. Observation of the curing ovens resulted in the identification of nonconformance B.7. This particular operation dealt with the heating of a heat sealable mylar. As stated in nonconformance B.7, there are no written instructions/procedures, which would provide guidance for the performance of this operation.

Components being used to manufacture cable were compared to MIT BOM requirements and found acceptable in all cases observed. MIT's were examined for product traceability and the control process in the manufacturing area and were found acceptable.

Controls of the preparation and approval of the MIT's were examined in respect to: (1) preparation and approval by separate individuals; and (2) revision preparation and approval accomplished by the same individuals. Those MIT's examined were found acceptable in this area.

MIT numbering and revision levels were examined and nonconformance B.10 was identified.

Quality Control verification of electrical tank testing was examined and nonconformance B.11 was identified.

ORGANIZATION: ROCKWELL INTERNATIONAL, INC.
ENERGY SYSTEMS GROUP
CANOGA PARK, CALIFORNIA

REPORT NO.: 99900266/82-02	INSPECTION DATE(S) 10/25-29/82	INSPECTION ON-SITE HOURS: 28

CORRESPONDENCE ADDRESS: Rockwell International, Inc.
Energy Systems Group
ATTN: Mr. D. Empey, Quality Assurance Director
8900 De Soto Avenue
Canoga Park, CA 91304

ORGANIZATIONAL CONTACT: Mr. D. Empey, Quality Assurance Director
TELEPHONE NUMBER: (213) 700-3926

PRINCIPAL PRODUCT: Class 1, 2, and 3 vessels, piping, and components.

NUCLEAR INDUSTRY ACTIVITY: Commercial nuclear production represents 25% of total company production. Three nuclear contracts are presently in-house for current and future production.

ASSIGNED INSPECTOR: J. W. Sutton 11-30-82
J. W. Sutton, Reactive & Component Program Section (R&CPS) Date

OTHER INSPECTOR(S):

APPROVED BY: for I. Barnes, Chief, R&CPS 11-30-82
Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and 10 CFR Part 21.

B. SCOPE: Followup on 10 CFR Part 21 reports, calibration, and procurement control.

PLANT SITE APPLICABILITY:

Not identified.

ORGANIZATION: ROCKWELL INTERNATIONAL, INC.
ENERGY SYSTEMS GROUP
CANOGA PARK, CALIFORNIA

REPORT NO.: 99900266/82-02	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraphs 3.3 and 4.1 in Section N4.00 of the Energy Systems Group (ESG) QA Manual: (a) two purchase orders were issued to a vendor for the supply of nuclear safety related wire who had not been listed as an approved source; and (b) quality verification at source and/or receipt for the safety related wire was not required.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraph 3 in Section N4.02 of the ESG QA Manual, and paragraph 3.2(b) in Section N4.00 of the ESG QA Manual: (a) the Quality Engineer did not retain file copies of the two safety related wire purchase orders; and (b) the "Inspection by QA" block had been improperly signed by an individual other than the designated QA Engineer.

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS:

1. Followup on 10 CFR Part 21 Reports - The NRC inspector reviewed ESG's followup activities for those 10 CFR Part 21 reports which had been initially reviewed during the previous inspection. ESG had issued a Technical Services Field Engineering Bulletin to all affected nuclear plants pertaining to the reported problem of "Hydrogen Recombiner Heater Lead-Wire Temperatures." Modification kits were being distributed to all plants on the list. A return notification to ESG is being requested from the plant operators. The NRC inspector also reviewed five closed and six in-process 10 CFR Part 21 evaluations that have been documented since the last inspection. The evaluations of these deficiencies were verified as being conducted in accordance with ESG instructions and procedures.

   Affected nuclear plant operators have been notified by letter and instructions are being formulated to correct the deficiencies.

ORGANIZATION: ROCKWELL INTERNATIONAL, INC.
ENERGY SYSTEMS GROUP
CANOGA PARK, CALIFORNIA

REPORT NO.: 99900266/82-02	INSPECTION RESULTS:	PAGE 3 of 3

2. Calibration - The NRC inspector reviewed Section N3.00 of ESG's QA Manual, "Calibration of Measuring and Test Equipment." In addition, the "Standard Operating Policies" and calibration procedure manual were reviewed for content. Twenty final acceptance gages, meters, and measurement equipment (including calibration standards) were examined for compliance to QA program requirements. The controlling computer run, dated October 22, 1982, and the calibration recall inventory system were reviewed for compliance to procedures. Calibration of all equipment examined was found to meet QA procedure requirements. As a result of the review of this documentation, the NRC inspector determined that calibration requirements are being implemented in accordance with the ESG QA Manual commitments.

3. Procurement Control - The NRC inspector reviewed Section N4.00 of ESG's QA Manual, "Receiving Inspection Procedure" (900.001), and "Standard Operating Procedure" (J-12) for content. Purchase orders, specifications, and receiving reports were reviewed for five orders. Procedures were discussed with project engineers, QA engineers, and receiving personnel. During the course of the inspection, it was noted that two purchase orders had been issued to an unqualified vendor, and the purchase orders had not been processed as required by QA procedures (see nonconformances in B. above).

ORGANIZATION: SARGENT & LUNDY ENGINEERS
CHICAGO, ILLINOIS

REPORT NO.: 99900507/82-02	INSPECTION DATE(S) 10/19-21/82 & 10/25-29/82	INSPECTION ON-SITE HOURS: 122

CORRESPONDENCE ADDRESS: Sargent & Lundy Engineers
ATTN: Mr. R. W. Patterson
Senior Partner
55 East Monroe Street
Chicago, IL 60603

ORGANIZATIONAL CONTACT: Mr. H. S. Taylor, Head, Quality Assurance Division
TELEPHONE NUMBER: (312) 269-6371

PRINCIPAL PRODUCT: Architect Engineering Services

NUCLEAR INDUSTRY ACTIVITY: Sargent & Lundy (S&L) is the architect engineer on 10 nuclear power plants that are in the design and/or construction phase and has minor involvement at 1 nuclear power plant that is under construction. S&L is also engaged in modification, repair, or service contracts on 12 operating nuclear power plants.

ASSIGNED INSPECTOR: C J Hale /for — 12/3/82
D. D. Chamberlain, Reactor Systems Section (RSS) — Date

OTHER INSPECTOR(S): P. H. Harrell, RSS
P. C. Sakowski, RSS

APPROVED BY: C J Hale — 12/3/82
C. J. Hale, Chief, RSS — Date

INSPECTION BASES AND SCOPE:

A. BASES: S&L Topical Report No. SL-TR-1A and 10 CFR Part 50, Appendix B.

B. SCOPE: Status of previous inspection findings and the following: (1) Cincinnati Gas and Electric Company (W. H. Zimmer) report stating S&L did not adequately translate applicable electrical separation criteria into the installation specifications and/or drawings; (2) Public Service Indiana
(Cont. on next page)

PLANT SITE APPLICABILITY:

This inspection relates to the following plant dockets: 50-358 and 50-546/547.

ORGANIZATION: SARGENT & LUNDY ENGINEERS
CHICAGO, ILLINOIS

REPORT NO.: 99900507/82-02	INSPECTION RESULTS:	PAGE 2 of 8

SCOPE: (Cont.) (Marble Hill, Units 1 and 2) report that existing procedures did not require specification or design changes made via engineering change notices, specification amendments, or drawing revisions to be contractually imposed on suppliers or contractors; (3) an NRC Region III report (Zimmer) stating the fire protection system was installed with no evidence of calculations or quality assurance; and (4) an NRC Region III request regarding a review of the seismic design of the main steam line from the outboard containment isolation valve to the turbine stop valves.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to S&L Topical Report (SL-TR-1A, Revision 5), Section 05.01 and Project Instruction PI-ZI-2.1, approved Design Document Changes (DDC) are not being incorporated into the affected design document within the specified two-month time period.

2. Contrary to SL-TR-1A, Revision 5, Section 05.01 and General Quality Assurance Procedure GQ-3.12, DDC status reports are not being maintained with the latest information as evidenced by: (1) status reports not listing all DDC's that have been issued at the site nor do the reports list all DDC's that have been received by S&L, and (2) status reports do not accurately reflect the current status of all DDC's.

3. Contrary to SL-TR-1A, Revision 5, Section 05.01 and Project Instruction PI-ZI-10.1, CABLE TRAY ROUTING POINT WEIGHT CALCS, REC 42381, performed for the Zimmer Project, compared the cable weight loading only to the 40-psf limit and failed to consider the weight of the cable trays as required to obtain the total tray support loading.

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Main Steam Line Seismic Design (Zimmer Project) - This area of inspection resulted from an NRC Region III request for NRR to evaluate the S&L design calculations regarding the seismic design of the main

steam lines in the turbine building on the Zimmer Project. The main steam lines from the outboard containment isolation valves to the main turbine stop valves should be designed to withstand the safe shutdown earthquake and remain functional (Regulatory Guide 1.29, Revision 1; FSAR, Chapter 30; and FSAR, Appendix C). There was participation in this review by Region III (D. Keating), an NRR mechanical (D. Terao) and a structural representative (R. E. Lipinski), and Region IV (D. D. Chamberlain). The NRR mechanical representative was able to review the seismic analysis and sample support calculations performed for the main steam line and found that based on the design documents examined, the FSAR commitments were being met.

The NRR structural representative was not able to obtain all of the information required to make a conclusion regarding the ability of the turbine building structures to protect and support the main steam line during the safe shutdown earthquake. He requested S&L to accumulate certain information and a followup inspection will be conducted at S&L when that information is available. Final conclusions regarding the adequacy of the main steam line design will be documented after this followup inspection.

2. Design Change Control - This area of inspection is a followup from a previous NRC inspection (99900507/82-01) regarding the interface between the licensee (Cincinnati Gas and Electric Company), S&L-site design personnel, and S&L-Chicago design personnel relative to the control of design changes. This inspection was performed at the site (Zimmer) and, based on the information obtained at the site, continued at the S&L-Chicago office. The issues discussed below were identified in the 82-01 report:

   a. It could not be determined if the licensee signoff blanks on DDC's were being properly completed.

      Based on a review of licensee documentation, it appears the licensee requirements are being met. It was noted that the cognizant engineer's signature is not required in cases where the DDC is initiated by the Generation Construction Group.

   b. S&L approves DDC's affecting vendor design documents, then the DDC is closed out. Because of S&L's limited responsibilities in the procurement area, there is no assurance that the vendor documents are being revised.

S&L-Chicago stated that they are not responsible for assuring that vendor documents are revised, they only approve DDC's affecting vendor documents; then send the DDC's to the site for processing by the licensee. Since S&L has no responsibility for assuring the revision of vendor documents, the licensee must assure that either the documents are revised or a permanent system is established to track the outstanding DDC's to the applicable vendor documents. This item will be referred to NRC Region III for followup, as applicable.

c. Some DDC's receive preliminary approval by S&L-site design personnel and construction proceeds based on this approval. A final approval by S&L-Chicago for some DDC's is not received for 6 months to 1 year later. More timely, final approval is indicated if construction is proceeding based on a preliminary approval.

S&L-Chicago has addressed the above concern by issuing a revision to Project Instruction PI-ZI-2.1 (Revision 16, dated October 25, 1982). Revision 16 requires final approval within 90 days from receipt of the DDC in the S&L-Chicago office. In addition, Revision 16 also provides clarification of required engineering review and approval signatures by the S&L-Chicago office, and places restrictions on S&L-site design group approval signatures for irreversible construction changes.

d. A log of DDC's for the electrical discipline is being maintained by the licensee and it does not appear the log is being updated on a regular basis.

The inspection at the site revealed the licensee has not accepted responsibility for maintaining a DDC log for the S&L electrical discipline. The log being used by the S&L electrical discipline was being generated by the licensee's construction contractor for their own use.

The area of inspection at S&L-Chicago included a review of the S&L structural, mechanical, and electrical discipline DDC logs. The logs and the DDC records for all three disciplines were reviewed for the following: (1) comparison of the licensee construction contractor generated log with the S&L logs, (2) comparison of the DDC's received by S&L and the DDC's listed in the S&L logs, and (3) comparison of the DDC status shown in the S&L logs with the status shown on the DDC. The inspection was also performed to

verify that S&L is processing DDC's as committed by Project Instruction PI-ZI-2.1, Revision 15.

This area of inspection revealed: (1) some DDC's issued at the site were not listed in the S&L logs; (2) DDC's had been received by S&L-Chicago, but were not listed in the S&L logs; and (3) the status shown on the DDC copy was not always accurately reflected in the S&L logs. In addition, some DDC's are not being incorporated into documents within the two-month time period required by PI-ZI-2.1. Two nonconformances were issued based on log discrepancies and untimely incorporation of design changes (see B.1 and B.2 above).

e. The interface between the licensee, S&L-site design personnel, and S&L-Chicago office design personnel requires further review to determine responsibilities relating to design and design changes.

Based on a review of the licensee and S&L documentation and discussion with licensee, S&L-site, and S&L-Chicago personnel, the following paragraphs describe the DDC flow path.

Certain authorized groups in the field initiate a DDC and then route the DDC to General Construction (a licensee group). General Construction (GC) approves the DDC, then the DDC receives a number from the site Document Control Group (DCG). GC then determines whether to send the DDC to S&L-site design personnel or to send it directly to S&L-Chicago. DDC's received by S&L-site design personnel are reviewed to determine if the change specified on the DDC is within their delegated signature authority and/or capability. If not within their authority or capability, they mark it for Chicago office approval only and the DDC is sent directly to S&L-Chicago. If within their authority, the DDC is given preliminary approval and returned to the DCG, with a copy sent to S&L-Chicago. DCG will distribute the DDC onsite and the change will be made. Preliminary approval given by S&L-site design personnel allows construction to begin prior to S&L-Chicago final approval on an as-risk basis.

When the DDC is received by S&L-Chicago, it will be reviewed and either disapproved or given final approval. The DDC is then returned to the site where appropriate action will be taken by the licensee as stated on the DDC.

In addition to S&L requirements, the following potential licensee procedural implementation problems were noted at the site: (1) one DDC had received a number and had been issued for construction without the required site approval, and (2) the Nuclear Engineering Division (NED) control file of DDC's was missing a number of DDC's. The concern here is that if NED is missing DDC's, other groups may also be missing them. The NRC Region III site representative was informed of the above problems.

3. Cable Tray Loading (Zimmer Project) - This area of inspection resulted from a Region III request for a generic review of the process used by S&L to determine if specific cable tray weight load calculations are required.

   S&L uses a "design index" number of 1.25 which relates to approximately 50% tray fill to require the performance of a weight calculation. They also limit/control routing in those areas which approach or exceed the specified design index. Region III believes that the design index number does not have a direct relationship to the cable weight and that the process being used may not be conservative.

   S&L has performed calculations for all cable tray points exceeding a design index of 1.0 on the Zimmer Project and more of the points exceed the allowed weight limit. During the review of these calculations, a nonconformance (B.3 above) was identified relative to the failure of the electrical group to consider the weight of the cable trays in the total tray support loading limit. S&L has committed to perform weight calculations for all cable tray points down to a design index of 0 on the Zimmer Project, and they assert that the design index of 1.25 does provide reasonable assurance (based on experience and previous data recorded) that the allowed cable tray loading will not be exceeded. The data reviewed during this inspection appears to show that the process being used is conservative, but this item will remain open pending the review (during the next NRC inspection) of the weight calculations to be performed on the Zimmer Project.

4. Fire Protection System - An NRC Region III report stating the fire protection (FP) system in the cable spreading room at the Zimmer Project was upgraded in 1979 to be installed in seismic supports without evidence of quality assurance or calculations by S&L.

   S&L could not produce any evidence that would indicate calculations were performed for the modification to the FP system. S&L claimed that, even though no evidence exists, calculations were performed prior to installing permanent system modifications. In 1979, the FP system was

classed as a nonsafety system and there were no S&L procedural requirements for maintaining calculations for this classification of systems.

Documentation examined during this inspection revealed: (1) S&L reviewed the FP system drawing (23380, Sh 16 and 17) submitted by the contractor (Grinnel Fire Protection Systems) in February 1978, and noted on the drawing that the system should be supported by temporary pipe hangers until S&L could issue a drawing detailing the construction and installation of the permanent supports; (2) S&L issued a drawing (M-426, Sh 20) in March 1978 to provide instructions for construction and installation of permanent supports (the drawing was reviewed by the mechanical, electrical, and structural disciplines); (3) in December 1979, S&L produced new design spectra curves for the Zimmer Project, which required all seismic supports in the plant be rechecked, including the supports in the FP system; (4) in 1981, a walkdown of the as-built FP system was performed at the site, and a calculation (EMD-033384) was done to verify the system supports would meet seismic-qualification requirements; and (5) in January 1982, the drawing (M-426, Sh 20) showing the construction and installation of the supports was reissued to provide additional details; i.e., show the as-built system.

The support drawing (M-426, Sh 20) issued in March 1978 was compared with the drawing revision issued in January 1982 to determine if any differences between the two existed. No differences in the basic design or installation location for the supports were noted. Based on this comparison, it appears that S&L did perform calculations for the original FP system support design and location. In addition, documents were provided by S&L that indicated QC had reviewed the original support design drawing.

In 1981, S&L instituted a new system classification program. Systems are now classified as safety, nonsafety seismically-designed, and nonsafety. This program replaced the old classification system of safety or nonsafety. The new program imposes the same QA record retention requirements for nonsafety seismically-designed systems as is required for safety systems. This new program should preclude recurrence of the record retention problem described above.

No nonconformances or unresolved items were identified.

5. Public Service Indiana (PSI) 10 CFR 50.55(e) Report - The report states procedures did not require specification/design changes to be contractually imposed on suppliers or contractors.

ORGANIZATION: SARGENT & LUNDY ENGINEERS
CHICAGO, ILLINOIS

REPORT NO.: 99900507/82-02	INSPECTION RESULTS:	PAGE 8 of 8

A review of the scope of work document between PSI and S&L for Marble Hill, Units 1 and 2, indicates that procurement and construction administration is the responsibility of PSI; therefore, S&L's procedures were not affected by the 50.55(e) report. No nonconformances or unresolved items were identified. This item is considered closed at S&L.

6. Electrical Separation Requirements (Zimmer Project) - This area of inspection resulted from a 10 CFR Part 50.55(e) report which stated that the S&L installation specification did not contain adequate electrical separation criteria and consequently that certain separation criteria were not being met. The problem appears to be relative to conduit that is being field routed by the site General Contractor. S&L has taken action to provide additional instructions or clarifications on electrical separation, but the basic problem appears to be a misunderstanding of the S&L design process. S&L has a project instruction which provides for a final review of separation requirements with the intent to identify and resolve all problem areas. Zimmer appears to be unique in that S&L does not dimension conduit drawings; therefore, a field walkdown would be required to verify separation. S&L has initiated steps to begin this review on Zimmer and it appears that this review will address all areas of concern. This item will remain open pending further review of the S&L design process with regard to electrical separation on other projects and to complete the evaluation of action taken on the Zimmer Project.

7. Training - The purpose of this area of inspection was to verify: (1) each S&L engineering discipline (mechanical, electrical, and structural) had issued procedures required by GQ-16.03 (Design Errors and Deficiencies) to control the reporting, documentation, and correction of errors and deficiencies in S&L design documents; (2) quality assurance had revised GQ-18.01 (Internal Audits) to eliminate procedural deficiencies; and (3) appropriate site and office personnel had been trained on the requirements of GQ-16.03 as committed in response to an NRC inspection (99900507/81-02).

All departments have issued procedures (electrical: ESI-254; structural: SAS-7, SAS-22, SAS-27, SAS-28, and SAS-40; and mechanical: MAS-26) to comply with the requirements of GQ-16.03. GQ-18.01 has been revised to eliminate procedural deficiencies. Records and documentation were reviewed to verify appropriate personnel had been trained. It is concluded from this review that S&L has implemented the program as committed.

ORGANIZATION: SOLIDSTATE CONTROLS, INCORPORATED
COLUMBUS, OHIO

REPORT NO.: 99900276/82-01	INSPECTION DATE(S) 8/30-9/3/82	INSPECTION ON-SITE HOURS: 26

CORRESPONDENCE ADDRESS: Solidstate Controls, Incorporated
ATTN: Mr. R. F. Cassidy
President
875 Dearborn Drive
Columbus, Ohio 43085

ORGANIZATIONAL CONTACT: Mr. R. McClung
TELEPHONE NUMBER: (614) 846-7500

PRINCIPAL PRODUCT: Uninterruptible Power Supply Systems

NUCLEAR INDUSTRY ACTIVITY: Approximately 1% of the production effort is devoted to nuclear.

ASSIGNED INSPECTOR: for L. B. Parker, Reactive and Component Program Section (R&CPS) — 11-30-82 Date

OTHER INSPECTORS:

APPROVED BY: for I. Barnes, Chief, R&CPS — 11-30-82 Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21 and 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made as a result of: (1) a potential 10 CFR Part 50.55(e) report by Florida Power and Light Company pertaining to five inverters which supply vital AC power to ECCS instrumentation that had failed under no-load conditions at St. Lucie, Unit 2; and (2) a 10 CFR Part 50.55(e) report by the Tennessee Valley Authority concerning an insufficient number of crimps or improper crimps that were made by Solidstate Controls, Incorporated (SCI) on compression-type terminals in single-phase static inverters furnished to Watts Bar Nuclear Plant, Unit 2

PLANT SITE APPLICABILITY: Docket Nos. 50-389, 50-391, 50-327, and 50-328.

ORGANIZATION: SOLIDSTATE CONTROLS, INCORPORATED
COLUMBUS, OHIO

REPORT NO.: 99900276/82-01	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 6 of the SCI procedure for "Reporting Defects or Non-Compliance Nuclear Regulatory Commission Regulations 10 CFR Part 21," no records had been maintained to assure that SCI had complied with their 10 CFR Part 21 procedure in regard to evaluation of: (a) a St. Lucie, Unit 2 report on five inverter failures; and (b) identified Watts Bar cable termination crimping problems.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraphs E.1, 2, and 5 of SCI Quality Assurance Instruction (QAI) III, "Design Control" and paragraph T:3 of QAI V, "Design Review Committee Report & Engineering Folder Routing List (Form SF-105)," the Project Engineer had: (1) used a new Form SF-105A which eliminated the Drafting Supervisor from the Design Review Committee; and (2) failed to submit the customer and internal specifications and requirements to the Quality Assurance Manager for review.

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Reactive Items:

a. A 10 CFR Part 50.55(e) report by the Tennessee Valley Authority (TVA) reported an insufficient number of crimps or improper crimps were made by SCI on some compression-type terminals on single-phase static inverters furnished to Watts Bar Nuclear Plant, Unit 2.

SCI investigated this problem at the site and an agreement (undocumented) was stated to have been made with TVA. In the agreement, SCI would furnish replacement wire and cable to TVA to correct the deficient condition. TVA was to furnish labor and terminations to complete the corrective action. The shipping tickets for the wire and cable shipped to Sequoyah and Watts Bar were examined. SCI did no further investigation of the generic aspects of the deficient crimps. QA Memo 44 dated July 24, 1981, was issued to all personnel holding workmanship manuals, delineating the procedure for crimping terminal lugs.

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Nonconformance B.1 was identified as a result of this reactive item and reactive item D.1.b.

b. A potential 10 CFR Part 50.55(e) report by Florida Power and Light reported that five inverters which supply vital AC power to ECCS instrumentation had failed under no-load conditions.

SCI had drawn the conclusion from a field trip to St. Lucie, Unit 2 and a theoretical analysis of the St. Lucie, Unit 2 Station magnetics that there is a "possibility" that the portions of the inverters which failed were subjected to out-of-specification temperatures. An undocumented search of reports and field documentation was stated to have been made by SCI to determine if other components had been replaced under similar questionable conditions. No other similar problem was identified as being found by this review.

SCI considers this problem as nongeneric and not reportable under 10 CFR Part 21. However, new components which have been redesigned by SCI to allow for additional thermal margin are to be provided by SCI to replace the St. Lucie, Unit 2 defective components.

Nonconformance B.1 was identified as a result of this reactive item and reactive item D.1.a.

2. Manufacturing Process Control - Three uninterruptible power supply systems (UPS) were being manufactured under the SCI (Class 1E) Quality Assurance Program Manual (QAPM) at the onset of this inspection; however, during the inspection it was discovered that the purchase specifications for the three "control jobs" did not require the UPS to be manufactured as Class 1E equipment. The specifications also did not require manufacture to be in accordance with Appendix B to 10 CFR Part 50 or invoke compliance with 10 CFR Part 21. Subsequently, Supplement No. 15 of Ebasco Services, Incorporated purchase contract NY-422668, dated August 5, 1982, was examined and determined to be Class 1E. Nonconformance B.2 was identified in this area of inspection.

3. Implementation of 10 CFR Part 21 - An August 11, 1982, draft of the SCI procedure, "Reporting of Defects or Non-Compliance Nuclear Regulatory Commission Regulations 10 CFR Part 21," was reviewed. SCI had posted this draft procedure on the bulletin boards with Section 206 of the Energy Reorganization Act of 1974 and 10 CFR Part 21. As a result of this review, nonconformance B.1 was identified.

4. Compliance With Quality Assurance Instructions - A detailed review of documentation relating to several control jobs revealed the following findings which are inconsistent with applicable QA program requirements documented in Quality Assurance Instructions:

ORGANIZATION: SOLIDSTATE CONTROLS, INCORPORATED
COLUMBUS, OHIO

REPORT NO. : 99900276/82-01	INSPECTION RESULTS:	PAGE 4 of 4

a. Information was entered incorrectly on six "Tags" attached to Control Job 18067, Capacitor Channels, Parts List 23254, Schematic 014E23254 as follows: (1) the assembly operation line had been signed and not dated; (2) the wired operation line had been dated where the initial was supposed to be and no initials were inserted; and (3) another inspection sticker on the assembly indicated that the inspection had been accomplished; however, the inspection had not been recorded on the "Tag".

b. Control Jobs 18628, 18067, 17988JC, and 17989JC had been reviewed by Design and Production Engineering and Test Supervision and found to be jobs which required a Class 1E controlled QA program; however, the procurement specification did not require Class 1E.

c. For Control Jobs 17988JC, 17989JC, and 18967, no drawing revision letters were included on the DR-001's, which is a form that assures that the latest copy of all drawings, parts lists, Bills of Material, and revisions will be used.

d. For Drawing No. 011D23216: (1) no DR-001 had been used to control the issuance of Revision B; (2) two different versions of Revision B had been issued; and (3) Revision A and one version of Revision B were in the Test Department, and Revision A was being used.

ORGANIZATION: SOUTHWEST RESEARCH INSTITUTE
SAN ANTONIO, TEXAS

REPORT NO.: 99900909/82-02	INSPECTION DATE(S) 9/20-21/82	INSPECTION ON-SITE HOURS: 14

CORRESPONDENCE ADDRESS: Southwest Research Institute
ATTN: Mr. Roger L. Bessey, Group Leader,
Department of Engineering Mechanics
6220 Culebra Road, P. O. Drawer 28510
San Antonio, TX 78284

ORGANIZATIONAL CONTACT: Mr. Timothy A. Fey, Research Engineer
TELEPHONE NUMBER: (512) 684-5111

PRINCIPAL PRODUCT: Research and Testing Laboratory

NUCLEAR INDUSTRY ACTIVITY: Southwest Research Institute is a nonprofit corporation conducting a number of research projects sponsored by both private industry and various government agencies. Their current nuclear work includes research projects for NRC, inspection of equipment at nuclear power generating plant sites, and conducting nuclear equipment qualification tests for a number of manufacturers and/or utilities.

ASSIGNED INSPECTOR: Alva L. Smith 10/15/82
A. L. Smith, Equipment Qualification Section (EQS) Date

OTHER INSPECTOR(S):

APPROVED BY: H. S. Phillips 10/15/82
H. S. Phillips, Chief, EQS Date

INSPECTION BASES AND SCOPE:

A. BASES: Appendix B to 10 CFR Part 50

B. SCOPE: Review of applicable test plan, witnessing Class 1E qualification tests for NAMCO limit switches, Seitz safety relief solenoid valves, and PYCO temperature elements.

PLANT SITE APPLICABILITY:

Grand Gulf Unit 1, Docket No. 05000416; and Clinton Unit 1, Docket No. 05000461

ORGANIZATION: SOUTHWEST RESEARCH INSTITUTE
SAN ANTONIO, TEXAS

REPORT NO.: 99900909/82-02	INSPECTION RESULTS:	PAGE 2 of 3

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Background - Mississippi Power and Light and the Illinois Power Company have contracted with NUTECH, San Jose, California, to perform a portion of their engineering effort for the Class 1E safety-related equipment qualification program for the Grand Gulf I and Clinton I Nuclear Power Stations. As a result of this contract, NUTECH has prepared a test specification and entered into a contract with Southwest Research Institute (SWRI), San Antonio, Texas, to qualify three Class IE safety-related components. The items to be tested by SWRI are:

   a. Main Steam Isolation Valve, Leakage Control System Limit Switch (NAMCO, Model EA-740, Revision K).

   b. Safety Relief Valve Solenoid (Seitz AG, Model 0-105-562e).

   c. Temperature Element (Pyco, Model N145C3224).

   Currently, SWRI intends to conduct radiation aging tests, thermal aging tests, and seismic tests "in-house" and subcontract the LOCA tests to the CONAX Corporation, Buffalo, New York.

2. Test Plan - In response to the NUTECH test specification, SWRI has prepared a test plan (SWRI Project 02-7124) to describe the procedures and tests which will be performed on the three components. An overview of the test plan was made by the inspector during this inspection to assure that the tests that were witnessed were accomplished in accordance with the test plan. An indepth evaluation of this plan to the specific requirements imposed in IEEE 323, 344, and NUREG-0588, Revision 1, will be performed and reported separately.

ORGANIZATION: SOUTHWEST RESEARCH INSTITUTE
SAN ANTONIO, TEXAS

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3. Quality Assurance - The inspector examined the receiving inspection reports for the five limit switches, five temperature elements, and two safety relief valve solenoids. The receiving inspection reports indicated that some items received were damaged; subsequently, a deviation and nonconformance report was issued and processed in accordance with the provisions contained in the SWRI Quality Assurance Program Manual.

   Since SWRI is accomplishing LOCA testing under subcontract to CONAX, the applicable purchase order was examined to determine that both regulatory (Criterion IV, 10 CFR Part 50, Appendix B) and SWRI quality assurance requirements had been met. The inspector determined that they had.

4. Witness of Tests - During this inspection, the NRC inspector witnessed baseline performance tests on all 12 items being tested. Baseline performance tests were conducted in accordance with paragraph 5.5 of the test plan to demonstrate that each component parameter was within the operability requirements described in tables 2.2-1 to 2.2-3 of Appendix B of the test plan. During this testing, no failures were noted and all parameters measured were within the performance envelopes specified in the test plan.

ORGANIZATION: STONE AND WEBSTER ENGINEERING CORPORATION
BOSTON, MASSACHUSETTS

REPORT NO.: 99900509/82-02	INSPECTION DATE(S) 8/16-20/82 & 8/30-9/3/82	INSPECTION ON-SITE HOURS: 116

CORRESPONDENCE ADDRESS: Stone and Webster Engineering Corporation
ATTN: Mr. R. B. Kelly
Vice President, Quality Assurance
P. O. Box 2325
Boston, MA 02107

ORGANIZATIONAL CONTACT: Mr. F. B. Baldwin, Assistant QA Manager
TELEPHONE NUMBER: (617) 589-6566

PRINCIPAL PRODUCT: Architect Engineering Services

NUCLEAR INDUSTRY ACTIVITY: Major active projects include Beaver Valley 2, River Bend 1, Shoreham, Nine Mile Point 2, Millstone 3, and North Anna 3. In addition, there are 50 modification/repair/service contracts. The aforementioned contracts cover work performed in the Boston, Cherry Hill, New York, and Denver offices.

ASSIGNED INSPECTOR: P. H. Harrell for
D. D. Chamberlain, Reactor Systems Section (RSS) — Date: 10/20/82

OTHER INSPECTORS: A. L. Smith, Equipment Qualification Section
P. H. Harrell, RSS

APPROVED BY: C. J. Hale
C. J. Hale, Chief, RSS — Date: 10/22/82

INSPECTION BASES AND SCOPE:

A. BASES: Stone and Webster (SW) Topical Report SWSQAP 1-74A and 10 CFR Part 50, Appendix B.

B. SCOPE: Status of previous inspection findings (Boston and Cherry Hill offices), training (Boston office), audits (Cherry Hill office), and the following items: (1) 10 CFR Part 50.55(e) Report (North Anna 3) - Pressurizer safety valve inlet piping design with large pressure drop could lead to valve chatter; (2) Region I Request (Beaver Valley 1) - cont. next page. . .

PLANT SITE APPLICABILITY: Docket Numbers 50-309, 50-334, 50-404, 50-410, 50-458, 50-280/281, and 50-338/339.

ORGANIZATION: STONE AND WEBSTER ENGINEERING CORPORATION
BOSTON, MASSACHUSETTS

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B. SCOPE: continued

Errors in seismic calculations performed by S&W for 79-14 Bulletin activities; (3) 10 CFR Part 21 Report (Maine Yankee) - Potential failure of safety injection actuation system to operate due to single relay failure; (4) Region I Request (Nine Mile Point 2) - S&W design for cable tray support locations failed to meet technical standard requirements; and (5) 10 CFR Part 50.55(e) Report (River Bend 1) - Failure by S&W to provide class 1E switchgear redundancy in recirculation pump circuitry for containment penetration protection.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

Contrary to Criterion V of 10 CFR Part 50, Appendix B and Sections 8.2 and 8.3 of NUPIPE Stress Analysis and Supports Evaluation Procedure, activities affecting quality (preparation and control of pipe stress analysis and support calculation packages for Beaver Valley 1) were not accomplished in accordance with the prescribed procedure.

C UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Nonconformance (81-04): Experience Records were not being updated on a yearly basis as required.

   The Engineering Assurance Division conducted a series of reviews to verify that Stone and Webster (S&W) requirements for Experience Records have been met. The NRC inspector examined 12 randomly selected Experience Records and all of them were current.

2. (Closed) Nonconformance (82-01): Failure to meet a commitment to the NRC relative to the updating of Experience Records.

   S&W commitments are tracked by an Action Log to assure that commitments are met. The four outstanding NRC findings were listed on the current Action Log.

3. (Closed) Nonconformance (82-01): An assumption made in calculation No. 12179-US (B)-221 was not confirmed and the assumption was not identified for later confirmation.

Problem Report (PR-NT-2) was issued to delineate the review required during analysis to verify the integrity of boundaries between areas isolated from the effects of High Energy Line Breaks (HELB) and adjacent areas subject to HELB effects. All S&W nuclear projects have responded to the Problem Report with either an interim or final response.

The NRC inspector will conduct a followup inspection of this area pending the S&W Engineering Assurance acceptance of all project responses. Also, NRC Region II will be notified of action taken by S&W for Surry 1 and 2 and North Anna 1 and 2 (S&W notified licensee of potential problem and offered to pursue matter further, if requested) for possible regional followup action with the licensee.

4. (Closed) Nonconformance (82-01): HVAC Calculation PB-196 for control building cooling load contained input information that was not confirmed and "yes" was not checked to indicate confirmation was required at a later date.

   The condition identified by the NRC inspector was also identified during an S&W internal audit. The closeout of the internal audit finding was reviewed and the closeout was satisfactory. For preventive action, a memorandum was issued by the River Bend Project on May 17, 1982, imposing additional control requirements on preparers of power calculations and restating reviewer responsibilities.

E. OTHER FINDNGS OR COMMENTS

1. Potential CDR Pressurizer Safety Valve Problem at North Anna, Unit 3 (Followup on item in 82-01 report) - This item, which was a result of a 10 CFR Part 50.55(e) report submitted to Region II by Virginia Electric and Power Company (VEPCO), was initially examined during the 82-01 NRC inspection; however, it remained open since (a) the final Electric Power Research Institutes (EPRI) report had not been issued; and (b) a decision concerning increasing the height of the pressurizer at North Anna 3 (thus requiring a redesign of the inlet piping configuration) was pending. During this inspection, it was determined that the pressurizer height will be increased by 10 feet, thus requiring a redesign of the inlet piping configuration. VEPCO has also directed S&W to incorporate additional block valves and power-operated relief valves in the pressurizer pressure relief design, as well as designating the specific make of valves to be used. S&W expects to complete the new valve and piping arrangement/design by the end of this year; however, the final stress analysis will not be completed until late next year.

Based on the above information (a new design different from that which the 50.55(e) report concerned), this item is being closed. The new design effort will be monitored and reviewed during future NRC inspections.

2. Errors in Seismic Calculations Performed by S&W for 79-14 Bulletin Activities (Boston office) - This area of inspection resulted from a Region I request relative to licensee reported errors in seismic calculations performed by S&W on the Beaver Valley, Unit 1 project. The licensee reported to Region I on August 14, 1981, that all IEB 79-14 reanalyses were satisfactorily completed. S&W was responsible for a major portion of this effort and they had waived certain administrative requirements in order to complete the technical reanalyses requirements by August 14, 1981. When the NRC was notified that IEB 79-14 work was completed, it was believed that the technical portion of the work was complete. A total of 22 nonconformances had been identified and resolved by S&W based on the 79-14 as-built review. The NRC inspector was not able to examine the completed calculation packages for work performed prior to August 14, 1981, because S&W did not maintain the completed packages as permanent plant records. A nonconformance (see B. above) was issued for failure to prepare and control pipe stress analysis and support calculation packages in accordance with the NUPIPE Stress Analysis and Supports Evaluation Procedure as indicated by the following:

   a. Completed packages for work completed prior to August 14, 1981, did not become a permanent part of plant records.

   b. No completed Form Z documents were available for NRC inspector review.

   c. The Engineering Assurance (EA) "Action Items Tracking Log - EA Audits Projects" listed 17 documents identifying unsatisfactory conditions or questions from EA audits of Beaver Valley 1 stress calculation packages as still partially unresolved as of August 19, 1982.

      Subsequent to August 1981, it was decided (S&W and licensee) to incorporate various calculations that had been done and do a reverification of the calculations and to get the calculation packages in the required administrative format. During this review, six additional nonconformances were identified (all of these have been reported to Region I by the licensee - LER's 82-007, 008, 011, 012, and 014). The NRC inspector examined samples of the completed packages from this verification effort and no additional problems were identified.

ORGANIZATION: STONE AND WEBSTER ENGINEERING CORPORATION
BOSTON, MASSACHUSETTS

REPORT NO.: 99900509/82-02	INSPECTION RESULTS:	PAGE 5 of 7

S&W issued a letter to the licensee on May 26, 1982, which stated in part, " . . . The Stone & Webster effort associated with the response to IE Bulletin 79-14 has been completed. QA Category I calculations have been completed which meet all of the requirements of our Engineering Assurance Procedure EAP 5.3 . . . ." However, certain EA audit items were still open as of August 19, 1982. The failure to close out the EA audit items was cited as part of the nonconformance identified in B above. NRC Region IV will follow up on the S&W corrective actions relative to the nonconformance identified during the next inspection at S&W-Boston.

3. Potential Failure of Safety Injection Actuation System to Operate Due to a Single Relay Failure (Boston office) - This area of inspection resulted from a 10 CFR Part 21 report issued by S&W stating that a single relay failure or loss of relay circuit power would prevent the automatic actuation of safety injection on the Maine Yankee plant. A single relay provides the safety injection actuation signal due to low pressurizer pressure. This relay is controlled by a two-out-of-four logic composed of four independent pressurizer pressure signals. Failure of this single relay or loss of power to the relay circuit will prevent automatic actuation of safety injection for those accidents resulting in loss-of-reactor coolant-system-pressure but not high containment pressure. Apparently, the licensee notified the NRC of this condition in February 1982, and the NRC in turn contacted S&W by phone due to concern that this could be a generic problem. S&W initiated a 10 CFR Part 21 review and a Part 21 report was issued on May 7, 1982. The S&W review of this problem revealed that Maine Yankee was the only project with this design contained in the S&W scope of supply. S&W notified the Maine Yankee licensee of the defect and offered their assistance in resolving the problem. The licensee has not requested any assistance from S&W.

   The S&W design error was apparently made in the 1969 to 1970 time-frame and no other errors of this type were found. This item will be closed based on the actions taken by S&W and on the 10 CFR Part 21 notification.

4. S&W Design for Cable Tray Support Locations Failed to Meet Technical Standard Requirements (Cherry Hill office) - This area of inspection resulted from a Region I request for followup on a problem identified on the Nine Mile Point Unit 2 (NMP2) project relative to the S&W design for cable tray supports. S&W cable tray support location drawings were issued and certain support locations did not meet Technical Standard ETS-AE11-1-1 requirements. The specific requirement violated was the installation of a support within one foot of the cable tray end. Apparently, S&W engineers were aware of

the deficiencies and were planning to do additional analyses at a later date to qualify the supports as installed. However, they were not formally tracking the deficiencies and no hold was placed on construction or installation. S&W has reviewed all NMP2 cable tray supports which exceed the one-foot overhang criteria. Design changes have been issued to place the supports on hold for final Field Quality Control signoff. Also, the NMP2 electrical division has committed to conduct a division level seminar by October 15, 1982, to give personnel instructions on use of the hold system. Completion of this training will be verified during the next NRC inspection. The NRC inspector reviewed the use of the hold system on NMP2 and River Bend 1 and concluded that the system in place provides a method for handling issues such as the cable tray support location problem. The instructions to be provided on use of the hold system should help preclude problems of this type in the future.

During the NRC inspector review of this area, the use of drawing check sheets was reviewed. All divisions appear to have drawing check sheets as required, but each project/division appears to be issuing their own version of a check sheet. An Engineering Department Technical Procedure (EDTP 3.3-C) was issued on May 7, 1982, which states that Boston will provide drawing check sheets for all divisions. A followup inspection will be conducted at S&W-Boston regarding the implementation of procedure EDTP 3.3-0.

The specific Region I concern is considered closed with only the followup areas identified to be completed during a future inspection at S&W.

5. Design Failure of S&W to Provide Class 1E Switchgear Redundancy in Recirculation Pump Circuitry (Cherry Hill office) - This area of inspection resulted from a 10 CFR Part 50.55(e) report from the River Bend Unit 1 licensee regarding the design failure of S&W to provide class 1E switchgear redundancy in recirculation pump circuitry for containment penetration protection. This problem was identified by a S&W responsible engineer during a review of one-line drawings for Regulatory Guide requirements. Regulatory Guide 1.63, Revision 2, requires that the circuit overload protection system for containment electrical penetrations conform to the criteria of IEEE Standard 279-1971, Criteria for Protection Systems for Nuclear Power Generating Stations. The 4.16 KV switchgear for the reactor recirculation pump motors did not meet the single-failure, IEEE 279 criteria in that two redundant Class 1E circuit breakers were provided with only one set of sensing current transformers and associated relays used to trip both redundant breakers. S&W has modified the River Bend design to provide for the addition of redundant overcurrent protection equipment for the 4.16 KV switchgear. S&W has also revised

the 480 V MCC specification for River Bend to require class 1E certification for all Motor Control Centers that feed 480 V electrical equipment through containment penetrations. S&W has not completed their generic review of this problem, but the preliminary indication is that this is a plant specific problem. This item will remain open pending S&W completion of the following:

a. Complete the generic evaluation of the problem.

b. Address the NRC inspector question regarding the capability to test operability of sensors (current transformers) during reactor operation as required by paragraph 4.9 of IEEE 279.

6. Training - S&W Quality Standard 2.12, "Qualification, Certification, Indoctrination and Continuing Education of Personnel," and eight associated S&W procedures were reviewed and evaluated to determine: (a) compliance with applicable code/regulatory requirements; and (b) total quality assurance program commitments. The training records of 36 employees and 11 S&W Construction Training Audit Reports were reviewed to verify implementation of the S&W program commitments. Within the scope of this inspection, the NRC inspector found no items of nonconformance.

7. Audits - Topical Report SWSQAP 1-74A and applicable S&W procedures were examined to determine quality assurance program commitments. To verify implementation of these commitments, the following EA documents were examined: 32 audit plans, 25 audit observations, 4 audit reports, 13 requests for extension, 25 audit observation replies, 4 audit schedules, 4 overall audit plans, and 2 audit trend analyses. Relative to the documents examined, the inspector found that the committed program is being implemented.

ORGANIZATION: TAYLOR FORGE
CICERO, ILLINOIS

REPORT NO.: 99900783/82-01	INSPECTION DATE(S) 8/16-20/82	INSPECTION ON-SITE HOURS: 32

CORRESPONDENCE ADDRESS: Taylor Forge
Gulf & Western Manufacturing Company
ATTN: Mr. J. A. Sider, Plant Manager
4735 West 14th Street
Cicero, Illinois 60650

ORGANIZATIONAL CONTACT: Mr. E. J. Razim, Manager, QA/QC
TELEPHONE NUMBER: (312) 242-3400

PRINCIPAL PRODUCT: Forgings, seamless rolled rings, pipe fittings, and flanges.

NUCLEAR INDUSTRY ACTIVITY: Approximately 1% of a current annual output of 500,000 lbs.

ASSIGNED INSPECTOR: J. T. Conway 10/15/82
J. T. Conway, Reactive & Component Program Section (R&CPS) Date

OTHER INSPECTOR(S):

APPROVED BY: I. Barnes 10-15-82
I. Barnes, Chief, R&CPS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: This inspection was made as a result of the 10 CFR Part 50.55(e) notification reported by Pennsylvania Power & Light Company relating to inadequate thickness of main steam relief valve discharge line flanges furnished to the Susquehanna Steam Electric Station. In addition to evaluating Taylor Forge's identification of the cause of the reported deficiency and the corrective action taken to prevent recurrence, the following (Cont. on next page)

PLANT SITE APPLICABILITY:

Docket No. 50-387

ORGANIZATION: TAYLOR FORGE
CICERO, ILLINOIS

REPORT NO.: 99900783/82-01	INSPECTION RESULTS:	PAGE 2 of 4

SCOPE: (cont.) areas were inspected: organization (training/qualifications), material and manufacturing process control, inspection, records, reporting of defects, and audits (internal/external).

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50, Section 2 of Specification C-71.1, and Section 1 of the QA Manual, a review of QA indoctrination and training records indicated that two Department Managers and two auditors did not receive indoctrination and training.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 4 of the QA Manual, a review of 11 nuclear orders completed in 1981 and 1982 indicated that there was no Receiving Report for 5 orders.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Specification C-70.26, a review of "trail cards" for recent nuclear orders and the record file for identification stamps indicated that: (a) an individual had performed visual inspections and used a stamp, but neither the individual nor the stamp was recorded; and (b) the stamps for three, terminated NDE inspectors were returned, but the date of return was not recorded.

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and Section 9 of Specification C41.00, a review of QA personnel records indicated that the recertification of a Level II inspector for MT exceeded the three-year frequency.

5. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Article NCA-3867.4 of the ASME Code, a review of 11 nuclear orders completed in 1981 and 1982 indicated that on 1 order the yield strength figure on the CMTR was different from the yield strength figure on the Material Analysis Report provided to Taylor Forge by the material supplier.

6. Contrary to Criterion V of Appendix B to 10 CFR Part 50, Section 9 of the QA Manual, and Section 3.3 of Specification C70.28, a review of QA personnel records and internal audit reports for 1981 and 1982 indicated that: (a) two auditors, who performed 14 audits during this period, were not certified; and (b) the QA Manager did not review and sign 4 audit reports.

ORGANIZATION: TAYLOR FORGE
CICERO, ILLINOIS

REPORT NO.: 99900783/82-01	INSPECTION RESULTS:	PAGE 3 of 4

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. In October 1981, Bechtel notified Taylor Forge that the 10-10" x 12" 300 lb. increaser flanges fabricated in 1976 and delivered to ITT Grinnell for use at the Susquehanna nuclear plant did not meet the thickness requirements of ANSI B16.5. Taylor Forge investigated the problem and determined that an engineer had drawn the correct 1 7/8" thickness on the layout graph but dimensioned it as 1 5/8". Another engineer converted the layout dimensions to machine drawing No. S-114185 (April 6, 1976) showing a thickness of 1.625". The 10 flanges were fabricated and inspected to this drawing.

   After receiving an order for approximately 120-10" x 12" 300 lb. increaser flanges, Taylor Forge modified the contour to reduce machining. At this time, an engineer noted the dimensional error and revised drawing No. S-114185 on April 18, 1979, to the correct thickness of 1.875", but did not notify management of the error. When the cause of the problem was determined, Taylor Forge management reprimanded the engineer and alerted him to the Part 21 requirements for reporting defects. Taylor Forge confirmed to Bechtel in the Razim/Hardie letter dated February 3, 1982, that the 10 flanges were the only ones manufactured to the thickness of 1.625" and furnished to ITT Grinnell.

2. A detailed review of documentation (e.g., QA Manual, procedures, training/qualification records, trail cards, heat cards, receiving reports, drawings, Material Analysis Reports (MAR), CMTR's, QA records, audit reports, etc.) led to the identification of six nonconformances (paragraph B above) and the following additional comments:

   a. The mill heat number on two trail cards and the certification (i.e., edition and addenda of the ASME code) on two MAR's were different from the respective information on the CMTR's.

   b. The QA Manual and applicable procedures appear to require updating to satisfy the requirements of Appendix B to 10 CFR Part 50. Examples of observed discrepancies are as follows:

ORGANIZATION: TAYLOR FORGE
CICERO, ILLINOIS

REPORT NO.: 99900783/82-01	INSPECTION RESULTS:	PAGE 4 of 4

(1) The organization chart did not reflect the current organizational structure, and the QA responsibilities of each group which function under the cognizance of the QA program were not described;

(2) The organizational positions with stop-work authority were not identified;

(3) Indoctrination/training and qualification programs were not being kept current;

(4) Qualifications and certifications of inspectors and auditors were not being kept current;

(5) There was no documentation to indicate that supplier's certificates of conformance are periodically evaluated by audits, independent inspections, or tests, to assure they are valid;

(6) There was no evidence of a documented check to verify the dimensional accuracy and completeness of design drawings and specifications; and

(7) There was no requirement for management (above or outside the QA organization) to regularly assess the scope, status, and compliance of the QA program to 10 CFR Part 50, Appendix B.

ORGANIZATION: TRANSAMERICA DELAVAL, INCORPORATED
ENGINE AND COMPRESSOR DIVISION
OAKLAND, CALIFORNIA

REPORT NO.: 99900334/82-02	INSPECTION DATE(S) 8/23-26/82	INSPECTION ON-SITE HOURS: 75

CORRESPONDENCE ADDRESS: Transamerica Delaval, Incorporated
Engine and Compressor Division
ATTN: Mr. C. Mathews, General Manager
550 85th Avenue
Oakland, California 94261

ORGANIZATIONAL CONTACT: Mr. R. E. Boyer, Manager, Quality Assurance
TELEPHONE NUMBER: (415) 577-7422

PRINCIPAL PRODUCT: Standby Diesel Generators

NUCLEAR INDUSTRY ACTIVITY: Commercial Nuclear Production of Standby Diesel Generators (3000-13,000 HP) totals 1% of company production. One contract is inhouse for future production.

ASSIGNED INSPECTOR: J. W. Sutton — 11-24-82
J. W. Sutton, Reactive and Component Program Section (R&CPS) — Date

OTHER INSPECTORS(S): I. Barnes, R&CPS
W. E. Foster, R&CPS

APPROVED BY: I Barnes — 11-24-82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and 10 CFR Part 21.

B. SCOPE: This inspection was made to review the status of previous inspection findings, QA program, procurement control and supplier evaluation, audits, and also as a result of the issuance of 10 CFR Parts 21/50.55(e) reports pertaining to the following deficiencies identified in standby diesel generators that have been furnished to numerous nuclear generating stations and units: (1) possible air entrapment in the governor oil system; (2) nonseismically qualified sensing line in the starting air system; and (3) a leaky check valve in the starting air system.

PLANT SITE APPLICABILITY: Air Entrapment: 50-416/417; 50-458; 50-413/414; 50-206; 50-440/441; 50-438/439; 50-460, 50-513; 50-329/330; 50-445/446:
(Cont. on next page)

ORGANIZATION: TRANSAMERICA DELAVAL, INCORPORATED
ENGINE AND COMPRESSOR DIVISION
OAKLAND, CALIFORNIA

REPORT NO.: 99900334/82-02	INSPECTION RESULTS:	PAGE 2 of 6

PLANT SITE APPLICABILITY: (Cont.)
*Harris; *Hartsville; and *Vogtle. Sensing Line: 50-322; 50-416/417; 50-458; 50-440/441; 50-438/439; 50-460, 50-513; 50-445/446; 50-329/330; *Harris, *Hartsville, and *Vogtle.

Check Valve: 50-329/330; 50-445/446; 50-440/441; 50-438/439; 50-518/521; 50-553/554.

*Units not identified.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 2.7.1 of Section 2 of the Quality Assurance Manual, dated February 27, 1981, the Quality Assurance/Quality Control Organizational Chart (page 1-10 of Section 1) has not been updated to reflect changes in the Quality Assurance/Quality Control Organization since January 1, 1982.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 4.4.3 of Section 4 of the Quality Assurance Manual, dated February 27, 1981, Kobe Steel Ltd., a supplier of diesel engine crankshafts (major/critical) had not been surveyed at a minimum of once every three years to assure their ability to comply with the specification requirements and to review the implementation of their quality program. A survey form completed by the Kobe Steel Ltd.'s american representative, dated March 8, 1982, was the only indication of a vendor survey record in the Transamerica Delaval supplier's file.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraphs 5.1.2 and 5.3.3 of Section 5 of the Quality Assurance Manual dated February 17, 1981:

   a. The component drawing released by engineering did not constitute the final instructions to assembly for definition of acceptance criteria to which the governor lube oil cooler must conform.

   b. Instructions for assembly of the governor lube oil cooler to the engine had not been provided in writing from manufacturing engineering to assembly.

   The foregoing was evidenced by the complete lack of Transamerica Delaval, Incorporated (TDI) documentation for detailed information regarding installation of the governor lube oil cooler onto the engine during the manufacturing/fabrication/assembly activities.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Nonconformance (82-01): QA records were not being protected against fire, damage, or loss.

   The inspector verified that QA records and documents are being microfilmed and transferred to a second location as indicated in TDI's written reply to the NRC, dated May 6, 1982. Ninety percent of the documents have been microfilmed and stored at a second location. Procedures for control of these documents have been generated and are being implemented.

2. (Closed) Nonconformance (82-01): Welder was observed welding without having the specified weld procedures in his possession.

   The inspector reviewed documentation that meetings were conducted and attended by TDI welders. Procedure 3.8, "Quality Control Technician," was reviewed for content. Audits of the ASME weld shop were conducted as required and documented. Inprocess welding was not inspected during this inspection as a result of the absence of any production welding activities. The vendor has fulfilled his commitments as outlined in their May, 6, 1982, reply to the NRC.

3. (Closed) Nonconformance (82-01): Weld material was not returned to stores within the prescribed time period.

   The inspector reviewed documentation consisting of letters, instructions, and memos issued by QA to weld shop management and foremen concerning this matter. Welding operations were not in progress during this inspection, so effectiveness of corrective actions could not be verified. This item has been closed pending further review during a subsequent inspection.

4. (Closed) Nonconformance (82-01): The weld shop was not audited during the fall of 1981.

   The inspector verified by review of documentation that the weld shop has been audited and an internal audit schedule has been generated and is being implemented. TDI has met the commitments contained in their reply to the NRC, dated May 6, 1982.

5. (Closed) Nonconformance (82-01): Betts Spring Company was not surveyed at a minimum of once every three years.

The inspector reviewed the audit performed by TDI on June 2-19, 1982. The approved suppliers list (ASL), dated June 30, 1982, was also reviewed for content. The commitments of the TDI reply, dated May 6, 1982, to the NRC has been implemented. During this inspection, however, a further instance of the failure to perform a committed vendor survey was identified (see paragraph B.2 of the inspection report).

6. (Closed) Nonconformance (82-01): Associated Spring Company put on ASL without a survey being completed.

   The inspector verified that the Associated Spring Company had been surveyed and the results documented. Instructions were issued to all personnel who perform surveys/audits. As identified in 5. above, however, a further instance was identified during this inspection of failure to perform a committed survey.

7. (Resolved) Unresolved Item (82-01): The ASL listed Associated Spring Company, a new supplier, with a high rating. The ASL procedure does not address how a new supplier is awarded a numerical rating without a history of received hardware.

   The inspector verified that the ASL, dated March 31, 1982, now permits the inclusion of newly added vendors without a rating assignment.

8. (Resolved) Unresolved Item (82-01): Absence of apparent measures to preclude recurrence of receipt of defective springs.

   The inspector ascertained that: (1) Melrose Spring and Tool Works was not fully aware of the time constraints placed upon the spring for stress relief; and (2) current suppliers are totally familiar with the time constraints, and this information appears in the manufacturing documents of the suppliers.

9. (Closed) Nonconformances C and D (81-02): Records had not been maintained to substantiate accomplishment of environmental qualification of motors for auxiliary lube oil and jacket water pumps.

   Based upon an onsite evaluation by NRC regional management of: (1) Bechtel's technical specification and appendices; (2) TDI's interpretation of the specifications; (3) Bechtel's replacement of the motors; and (4) TDI's current lack of domestic nuclear power station activity, we consider this item closed. In the event that TDI receives additional contracts, a thorough appraisal of implementation of procurement practices and translation of customer requirements will be made.

ORGANIZATION: TRANSAMERICA DELAVAL, INCORPORATED
ENGINEER AND COMPRESSOR DIVISION
OAKLAND, CALIFORNIA

REPORT NO.: 99900334/82-02	INSPECTION RESULTS:	PAGE 5 of 6

E. OTHER FINDINGS OR COMMENTS:

1. Followup on Headquarters and Regional Requests:

a. TDI Engine and Compressor Division, filed a 10 CFR Part 21 Report on December 9, 1981, regarding a potential problem of air entrapment in the Woodward Governor oil System. The potential problem occurs if the governor lube oil cooler is installed above the oil level of the governor and the oil level in governor is low. The report to the Commission and letters to the customers indicated that detailed instructions for relocating/retubing the lube oil coolers would be sent to each site by January 15, 1982. The detailed instructions were not provided to each site by January 15, 1982; however, the inspector noted that instructions (a procedure and drawing) had been provided to three sites between March 16 and July 6, 1982.

Also, the inspector noted that Woodward Governor Company's Engine and Control Division Drawing No. 9988-214, dated July 1979 depicts a remotely installed governor lube oil cooler, while Publications Nos. 36641B and 36641D state in part, regarding remotely mounted heat exchangers, "The heat exchanger should be mounted as near as conveniently possible to the governor and below the governor's oil level so no air will be trapped in the system." TDI elected to disregard the information provided by Woodward. Further, the inspector noted that TDI had no documented instructions, procedures, or drawings regarding installation of the governor lube oil cooler onto the engine during the manufacturing/fabrication/assembly activities (see nonconformance, paragraph B.3).

b. The Tennessee Valley Authority filed a 10 CFR Part 50.55(e) report on March 3, 1982, regarding a leaky check valve in the air start system of the standby diesel generators. This deficiency was addressed in Vendor Inspection Report No. 99900334/82-01.

Subsequent to the aforementioned report, a modified check valve has successfully completed the seismic qualification test. Documentation regarding identification of the tested article and certification of test requirement was not thorough. Efforts are still underway to correct the deficient valves, and documentation of the tested article will be reviewed during a subsequent inspection.

c. Bechtel Power Corporation, Grand Gulf Project filed a 10 CFR Part 21 report on March 3, 1982. The report addressed the nonseismically qualified starting air pressure sensing line which is attached

between the air compressor and storage tank. TDI also filed a 10 CFR Part 21 report, dated March 19, 1982. TDI has performed some tests which resulted in a solution of the problem; however, there was no evidence that the sensing line had been supplied by them.

2. QA Program: The inspector reviewed TDI's QA Manual, Sections 1 and 2, dated February 27, 1982. The organizational charts and duties of personnel were also reviewed. As a result of this review, one nonconformance was identified. The organizational chart, page 1-10 of Section 1, had not been updated to reflect the current quality assurance/quality control organization and duties (see nonconformance, paragraph B.1).

3. Procurement Control and Supplier Evaluation: The inspector reviewed TDI's QA Manual, Section 4, "Procurement Document Control." The inspector also reviewed documentation letters, purchase orders, and specifications to determine if the requirements of this section of the QA Manual were being implemented. Surveys, long and short form, of suppliers audit/survey schedules were reviewed for compliance to the QA/QC requirements. As a result of this review of documentation, one nonconformance was identified. TDI had ordered components (crankshafts) from a vendor who had not been surveyed as required by the QA manual commitments (see nonconformance, paragraph B.2.).

4. Audits: The inspector reviewed TDI's QA Manual, Section 17, "Internal Audits," seven internal and two management audits. The current audit schedule, qualification of auditors, and audit training files were also reviewed. The corrective action taken as a result of audit findings was reviewed for implementation. As a result of this review, the inspector determined that the requirements for internal and management audits were being followed in accordance with QA program commitments.

ORGANIZATION: VELAN VALVE CORPORATION
WILLISTON, VERMONT

REPORT NO.: 99900346/82-01	INSPECTION DATE(S) 8/30-9/3/82	INSPECTION ON-SITE HOURS: 56

CORRESPONDENCE ADDRESS: Velan Valve Corporation
ATTN: Mr. E. I. Francois
Vice President, Quality Assurance
Avenue C, Griswold Industrial Park
Williston, Vermont 05495

ORGANIZATIONAL CONTACT: Mr. Duncan Winton, QC Manager
TELEPHONE NUMBER: (514) 748-7743

PRINCIPAL PRODUCT: Nuclear Valves

NUCLEAR INDUSTRY ACTIVITY: Current contracts to furnish valves to nine nuclear sites which is approximately 6% of total sales.

ASSIGNED INSPECTOR: J. Barnes for J. T. Conway, Reactive and Component Program Section (R&CPS) — Date: 11-4-82

OTHER INSPECTOR(S): J. W. Hamilton, R&CPS

APPROVED BY: J. Barnes I. Barnes, Chief, R&CPS — Date: 11-4-82

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B

B. SCOPE: This inspection was made as a result of: (1) the identification of (a) damaged internals in 6-inch swing check valves at Salem, Unit 2; (b) jammed disks in 6-inch swing check valves at Point Beach, Unit 1, (c) jammed 2½-inch stop check valves at Davis Besse, Unit 1; and (2) the receipt of allegations by NRC Region II regarding welding controls. In addition, the following programmatic areas were inspected: training/qualification, control of special processes, material and manufacturing process controls, nonconformance/corrective action, NDE, records, audits (internal/external), and reporting of defects.

PLANT SITE APPLICABILITY: Docket Nos. 50-311, 50-266, and 346.

ORGANIZATION: VELAN VALVE CORPORATION
WILLISTON, VERMONT

REPORT NO.: 99900346/82-01	INSPECTION RESULTS:	PAGE 2 of 5

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 4 of Quality Control (QC) Procedure VELW-QC-156.8, a review of Operation and Routing Sheets (ORS) and Nuclear Valve Assembly Routing Sheets (NVARS) for domestic nuclear orders indicated the absence of an inspector's stamp and date for the following inspection activities: (a) verification of transfer of marking on an ORS for PO P3-5500-N; and (b) assembly and final inspection in an NVARS for Data Package W810408.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 4 of QC Procedure VELW-QC-156.15, a review of record maintenance indicated that calibration records were neither identified in the QC Documentation Manager's log nor stored in the vault.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Sections 2.4 and 2.13 of QC Procedure VELW-QC-156.13, a review of the Quality Assurance Department Reports relating to corrective action implementation did not address either the review of or the effectiveness of corrective action.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

(Closed) Nonconformance (80-01) - The F No. on a Welding Procedure Qualification Record (PQR) was different to the F No. on the applicable Welding Procedure Specification (WPS).

The inspector verified that the September 1970 version of PQR VEL-P-597 was changed to reflect the correct F No. 7 which was applicable at the time of qualification of WPS GT-8860, Rev. 0. In addition, a review of WPS GT 8860, Rev. 3, "Manual GTAW of Austenitic Stainless Steel," (January 1, 1982) showed filler metal group No. F-6 and weld metal analysis No. A-8 which are identical to those on supporting PQR Nos. VEL-P-597(A) and 597(B), both dated October 13, 1977, and GT-552 dated September 18, 1974.

E. OTHER FINDINGS OR COMMENTS:

1. Allegations - In January 1982, a former welder at Velan made allegations regarding the adequacy of welding controls utilized at the Williston plant. A review of documentation, welding, and NDE activities

relating to four nuclear projects currently in process resulted in the following inspection findings which do not substantiate the allegations received by NRC Region II:

a. Documentation of welds by others:

The former welder indicated that on several occasions someone had printed or written his name in the welding log book. However, the other person's initials always accompanied his name. The welder was not certain whether he had made the particular weld since he did not have the opportunity to crosscheck it against the ORS. He also expressed concern about the use of welders' identification stamps, since he only used his on one occassion.

A review of welding log books showed that individual welders had entered the details of each weld, dated, and signed the welding log book. There was no indication that the entries in the welding log books were made by individuals other than a welder. A review of ORS's (i.e., travelers) indicated that each welding operation was dated and documented on the ORS by the welder's identification number and signature. This satisfies the Code requirements regarding the identification of a welder to the work performed by that individual.

b. Multiple pass vs. single pass welds and radiography vs. liquid penetrant or magnetic particle examination:

The former welder was of the opinion that multiple pass welds should be used while the procedure required only a single pass weld. However, he stated that management never encouraged or instructed welders to deviate from prescribed procedure. It was also his opinion that many welds should have been radiographed instead of liquid penetrant or magnetic particle examined.

A review of WPS's, PQR's, qualification records of welders, NDE procedures, qualification of inspectors, and ORS's; and an evaluation of manufacturing operations indicate that both welding and NDE activities were being conducted in accordance with approved, qualified procedures, and by qualified individuals. The requirements contained in the WPS's and the NDE procedures are consistent with ASME Code requirements.

ORGANIZATION: VELAN VALVE CORPORATION
WILLISTON, VERMONT

REPORT NO.: 99900346/82-01	INSPECTION RESULTS:	PAGE 4 of 5

2. Based on discussions with Velan's Corporate Manager of Engineering and a review of applicable documentation relating to the problems identified at three nuclear facilities, the inspector's findings are as follows:

   a. Salem, Unit 2 - Two 6-inch swing check valves in the steam supply line to the turbine driven auxiliary feed water pump suffered internal damage. Velan has supplied replacement internal parts (ref. Farrell/Sullivan letter, dated June 19, 1981) to the licensee. Based on a review of the circumstances and material evidence returned from the site, both Velan and Public Service Electric & Gas Company (PSEG) have determined that there is no generic design problem associated with the subject Velan valves. PSEG has initiated a review (ref. Rippe/Farrell letter, dated June 26, 1981) of the design of the main steam piping to auxiliary feed pump turbines where the valves are installed, to determine if certain characteristics of the system require modification.

   b. Point Beach, Unit 1 - Two 6-inch 1500 lb. swing check valves in the low head safety injection lines had unacceptable back leakage during a check valve leakage test.

      The problem was identified as the sticking of a 6-inch swing check valve in the open position due to a disc nut lockwire jamming against a machined relief in the body. Based on Velan's review of layout analysis of all swing check valve designs and physical manipulation of valves in-house, it was determined that the problem is a function of an accumulation of the machining tolerances. Velan has notified their customers to reroute the lockwire if the valve can be induced to jam open. Otherwise, no corrective action is required. In addition, Velan has changed the valve design to incorporate a stainless steel cotter pin in place of the disc nut locking wire and added an operation at assembly inspection to lift the hanger and disc assembly to determine if jamming takes place.

   c. Davis Besse, Unit 1 - Three 2½-inch stop check valves in the high pressure injection lines remained closed during a test of check valves.

      Velan Engineering has determined that the use of excessive closing torques by the licensee and a steep valve seat angle of 15^{o} were the major factors in disc jamming of the stop check valves. The three valves in question were reassembled with new discs having an angle of 30^{o}. A functional test was performed using 150 ft.-lbs. closing torque, which resulted in an insignificant amount of pressure (2½ to 2 psi) required to pop the disc open. Velan's stop

check valves are currently being manufactured with a seat angle of 30°. In addition, Velan has recommended to their customers that the torque to close the valve should not exceed 150 ft.-lbs.

3. A detailed review of documentation (e.g., QA Manual, welding and NDE procedures, training/qualification records, ORS's, data packages, QA records, audit reports, etc.) resulted in the identification of three nonconformances (see B. above) and the following additional observations:

   a. For Welding Procedure Specification APA-0161, the welding log book index showed Rev. 2 (April 16, 1980), but the QA record file copy was Rev. 3 (July 30, 1980).

   b. For Procedure Qualification Record No. PA-002, the preheat (QW-406) and technique (QW-410) variables had been whited out and retyped. There was no signature or initials by either change.

   c. There was no evidence of a procedure/instruction for the use and responsibility of a "Nuclear Approved" stamp which was noted on Material Identification Tags.

   d. The QA Manual and applicable procedures appear to require updating to satisfy the requirements of Appendix B to 10 CFR Part 50. Examples of observed discrepancies are as follows:

      (1) The organization chart does not reflect the current organizational structure.

      (2) The organizational positions with stop work authority are not identified.

      (3) There was no requirement for management (above or outside the QA organization) to regularly assess the scope, status, and compliance of the QA program to 10 CFR Part 50, Appendix B.

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
NUCLEAR TECHNOLOGY DIVISION
MONROEVILLE, PENNSYLVANIA

REPORT NO.: 99900404/82-02	INSPECTION DATE(S) 10/25-29/82	INSPECTION ON-SITE HOURS: 102

CORRESPONDENCE ADDRESS: Westinghouse Electric Corporation
Nuclear Technology Division
ATTN: Dr. R. J. Slember, General Manager
P. O. Box 355
Pittsburg, PA 51230

ORGANIZATIONAL CONTACT: Mr. P. T. McManus, Manager, Product Assurance
TELEPHONE NUMBER: (412) 273-7988

PRINCIPAL PRODUCT: Nuclear Steam Supply Systems

NUCLEAR INDUSTRY ACTIVITY: The Nuclear Technology Division of Westinghouse Electric Corporation (W-NTD) employs approximately 2,200 people that are assigned to domestic nuclear power plant activities.

ASSIGNED INSPECTOR: R. H. Brickley 12/10/82
R. H. Brickley, Reactor Systems Section (RSS) Date

OTHER INSPECTOR(S): (See paragraph E.1)

APPROVED BY: C. J. Hale 12/10/82
C. J. Hale, Chief, RSS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21; 10 CFR Part 50, Appendix B; and Topical Report No. WCAP-8370.

B. SCOPE: Inspection of the status of previous inspection findings and the following: (1) a request from the Office of Nuclear Reactor Regulation (NRR) for participation in a technical and QA programmatic audit of the generic safety parameter display system, and (2) a Westinghouse report to the Office of Inspection and Enforcement concerning reactor cooling system wide range pressure transmitter inaccuracies.

PLANT SITE APPLICABILITY:

Not identified.

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
NUCLEAR TECHNOLOGY DIVISION
MONROEVILLE, PENNSYLVANIA

REPORT NO.: 99900404/82-02	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

It was not clear whether inputs from the instrumentation and controls channel list, control and electrical system standard, or some other component functional requirements document are required in the component specification for the reactor cooling system wide range pressure transmitter.

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

(Closed) Nonconformance (82-01): W-NTD had not performed a formal evaluation each year or conducted an audit of Anchor Darling every 3 years to maintain them as a qualified supplier nor had they otherwise requalified them prior to Anchor Darling performing modifications to valves for Watts Bar. The last audit of Anchor Darling was in March 1975, and the last supplier performance evaluation was in November 1977.

The NRC inspector verified the corrective action and preventive measures committed in the Westinghouse letter dated August 23, 1982; i.e., Procedure WRD-OPR-3.4, "Field Change Notice Processing System" was revised on August 12, 1981, to require that a purchase order or purchase order change be issued to a vendor when a field change notice requires work to be done at a vendor facility. This will require the cognizant quality engineer to review the purchase order or purchase order change and verify that the vendor is on the qualified supplier list. However, the W-NTD commitment to a formal evaluation or audit of a supplier on an annual basis was not made until September 1977; therefore, a nonconformance did not exist.

E. OTHER FINDINGS OR COMMENTS:

1. Safety Parameter Display System (SPDS) - This item resulted from a request from the NRR for participation in a technical and QA programmatic audit of the Westinghouse generic SPDS activities. The NRR audit team was composed of the following personnel:

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
NUCLEAR TECHNOLOGY DIVISION
MONROEVILLE, PENNSYLVANIA

REPORT NO.: 99900404/82-02	INSPECTION RESULTS:	PAGE 3 of 4

L. Beltracchi, Human Factors Engineering Branch (HFEB)
R. Licciardo, Reactor Systems Branch (RSB)
G. Lapinsky, HFEB
J. Joyce, Instrumentation & Controls Systems Branch

The members of the team reviewed the documentation available at this time in the system development consisting of the design basis and functional requirements documents; human factors evaluation and the technical support complex, supplement 1 reports; and the visual momentum paper. The results of this audit were discussed with the Westinghouse staff and will be documented by the NRR staff in a report which will be transmitted to Westinghouse.

The review of available documentation and discussions with the Westinghouse staff disclosed that records of the design process that would be required by Topical Report WCAP-8370 were not developed for the design basis and functional requirements documents. Reportedly, these documents were developed in accordance with the requirements of WCAP-8370; however, the formal documentation to support these statements was not completed. The human factors evaluation process was well documented and appeared to be in accordance with QA program requirements.

It should be noted that the SPDS has not been classified by the NRC as a safety system (Class 1E) and, therefore, would not be subject to the detailed requirements of the WCAP-8370 program. The applicability of the WCAP-8370 program to the design and development of the SPDS remains under evaluation by NRR and will be a subject to future discussions with the Westinghouse staff.

There were no nonconformances or unresolved items identified.

2. Reactor Cooling System (RCS) Wide Range Pressure Transmitter Inaccuracies - This item concerns a report by Westinghouse to the Office of Inspection and Enforcement that recent qualification tests in a post-accident, high energy line break environment have indicated that the wide range pressure measurement instrument channels exhibit ambiguities in their accuracy which could result in inappropriate operator actions. The Office of Inspection and Enforcement notified applicable licensees of this condition via IE Information Notice No. 82-11, dated April 9, 1982.

READEX FICHE best copy available

The examination of the Safety Review Committee files, specifications, standards, functional requirements, and applicable procedures disclosed the following:

a. The instrument and controls channel list specified that the wide range pressure transmitter (WRPT) must have a ±30 psi accuracy.

b. The control and electrical system standard specified that the WRPT must have a specified reference accuracy of ±0.5%, an accuracy of ±10% under thermal shock and temperatures greater than 300° F, an accuracy of ±7.5% at temperatures between 150° and 300° F, and an accuracy of ±5% at temperatures greater than room temperature.

c. Revisions 1 and 2 of the equipment specification specified that the WRPT must have specified reference accuracy of ±0.5%, an accuracy of ±10% at temperatures between 130° and 280° F, and an accuracy of ±25% under post-accident conditions.

d. Revision 3 to the equipment specification changed the requirements to a specified reference accuracy of ±0.5% and ±5% under post-accident conditions.

e. The accuracy of the existing WRPTs in all Westinghouse plants, under post-accident conditions, is ± 13% of span (3000 psig) or ± 390 psig.

It could not be determined whether the accuracy requirements of the instrumentation and controls channel list, the control and electrical system standard, or some other components requirements document was applicable to the WRPT equipment specification. This matter is considered unresolved (see C. above).

3. Computer Code Errors (Ref. 99900404/82-01, paragraph D.4) - Westinghouse had initiated an investigation of main frame A computer malfunctions and its possible effects on safety-related codes that were run.

Westinghouse has completed the investigation of the computer files that were created during the week when the main frame A (MFA) hardware problem occurred (March 9, 1979 through March 19, 1979) and the permanent files created since January 1, 1978 (those currently used files which were created earlier). The investigation involved 375 comparison runs, including 190 safety-related codes. No additional errors were identified; therefore, this item is considered closed.

ORGANIZATION: WYLE LABORATORIES
HUNTSVILLE, ALABAMA

REPORT NO.: 99900902/82-07	INSPECTION DATE(S) 8/9-12/82, 8/16-20/82	INSPECTION ON-SITE HOURS: 32

CORRESPONDENCE ADDRESS: Wyle Laboratories
ATTN: Mr. W. W. Holbrook
General Manager of Eastern Test
and Engineering Operations
7800 Governors Drive
Huntsville, Alabama 35807

ORGANIZATIONAL CONTACT: Mr. E. W. Smith, Director of Contracts and Purchasing
TELEPHONE NUMBER: (205) 837-4411

PRINCIPAL PRODUCT: Testing Services

NUCLEAR INDUSTRY ACTIVITY: Wyle Laboratories, Huntsville, Alabama, provides a variety of nuclear services to the industry which include nuclear environmental qualification, seismic testing/analysis, high flow valve/component testing, valve refurbishment/recertification services, snubber repair/test services, architect/engineer support services, and field measurement services.

ASSIGNED INSPECTOR: D. T. Hubbard for — 12/2/82
A. R. Johnson, Equipment Qualification Section (EQS) — Date

OTHER INSPECTOR(S): G. T. Hubbard, EQS
J. Benson, NRC Consultant, Sandia National Laboratories

APPROVED BY: H. S. Phillips — 12/2/82
H. S. Phillips, Chief, EQS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B

B. SCOPE: The purpose of the inspection was to witness, observe, and inspect the first 24 hours of a loss-of-coolant accident (LOCA)/high energy line break (HELB) environmental qualification (30-day) test for the Crosby Valve and Gage Company lift indicating switch assemblies (two models) and a set pressure verification indicating device. All three Class 1E equipment devices were to be qualified in accordance with IEEE Standards 323-1974, 344-1975, and 382-1980 and meet the requirements of NUREG-0588, Revision 1, Category I.

PLANT SITE APPLICABILITY:

Both Class 1E equipment devices are designed to provide discrete/continuous indication of safety relief valve (SRV) lift position, applicable to various BWR and PWR nuclear power generating stations.

ORGANIZATION: WYLE LABORATORIES
HUNTSVILLE, ALABAMA

REPORT NO.: 99900902/82-07	INSPECTION RESULTS:	PAGE 2 of 4

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Background:

The Crosby lift indicating switch assemblies (N orifice, serial No. 0001 and R orifice, serial No. 0021) and the Crosby set pressure verification indicating device (no model/serial number) were to be environmentally tested to meet the requirements of the LOCA/HELB accident conditions at their end-of-qualified-service life and to demonstrate the adequate capability of performing their safety-related functions. Crosby Valve and Gage Company met with the NRC staff (Messrs. P. De Benidito, J. Lombardi, and J. Zudnas, NRR Mechanical Equipment Qualification Group) on August 21, 1980, Bethesda, Maryland, and submitted the initial Crosby Qualification Specification T-16340, Revision 0. Wyle Laboratories since developed two approved qualification test plans (45391-1, Revision B, dated December 1980 and 45609-1, dated May 20, 1981) from the Crosby qualification specification. The purpose of this inspection was to assure that the LOCA/HELB qualification tests were conducted in accordance with these test plans/procedures and to review documented test records completed by Wyle personnel for acceptance within the prescribed margins outlined.

2. Results of Prestressing Qualification Tests and LOCA/HELB Qualification Test Setup:

a. The NRC inspector reviewed the anomalies which occurred during the prestressing qualification tests conducted in accordance with the test plans. During the seismic prestressing qualification, performed at Wyle Laboratories in December 1981, one lead switch (B contact) failed in one redundant train of the lift indicating switch assembly (R orifice, serial No. 0021). A report from Crosby, which will address this technical issue, will be reviewed during a future inspection.

No. 0001 were not functioning. Switches B and F of serial No. 0001 were double actuating and switch E was still actuating with an .065 inch offset. Switches C and F of serial No. 0021 had shorted at an operating voltage of 30 volts, but switch C resumed normal operating characteristics at 6 volts. Switch F remained shorted with the reduced operational voltage.

A report from Crosby, which will address the technical issues of paragraphs 3a-c, will be reviewed during a future inspection.

4. Inspection Results:

Within the scope of this inspection, the NRC inspector determined that:

a. Qualification test plan/procedures met the requirements of NUREG-0588, Revision 1.

b. Test and test activities performed were in accordance with detailed test procedures.

c. All necessary information and data were collected to allow evaluation of test results and were properly recorded and documented.

d. The installation of test specimens in the environmental test chamber was in accordance with the qualification test plan/ procedures.

e. Notice of Anomalies were prepared in a timely manner, properly documented, and properly dispositioned.

f. The lift indicating switch assemblies (N orifice, serial No. 0001 and R orifice, serial No. 0021) did not meet the acceptance criteria as outlined in the qualification test plan, 45391-1, Revision B, during each of the LOCA/HELB tests of August 10-12, 1982, and August 17-20, 1982.

g. The Crosby set pressure verification indicating device (no model/serial number) met the acceptance criteria outlined in the qualification test plan 45609-1 Revision 0, and met the requirements of IEEE 323-1974, 344-1975, 382-1980, and NUREG-0588, Revision 1, Category I.

b. The NRC inspector reviewed the anomalies of the operational test setup for the LOCA/HELB environmental qualification test. All reed switches to the lift indicating switch assemblies (N orifice, serial No. 0001 and R orifice, serial No. 0021) had indicated change of state. The additional 100 feet of cable lead length used, instead of the original 20 feet prescribed in the specification, was suspected. The lift indicating switch assemblies (serial Nos. 0001 and 0021) were returned to Crosby Valve and Gage Company for analysis by X-ray techniques. The analysis detected no malfunction of the devices. A report from Crosby, which will address this technical issue, will be reviewed during a future inspection.

3. LOCA/HELB Environmental Qualification Test:

a. On August 10, 1982, this test started after obtaining the first qualification test profile (additional peak transient-margin ramp) required in NUREG-0588, Revision 1, and IEEE-STD-382-1980. Due to failure of test apparatus (e.g., electrical Kapton lead wire degradation, as evidenced by the flaking off of electrical insulation), the test was ordered shut down by the Crosby respresentative after completing the first 24-hour period of the test. Due to the lead wire degradation during this period, switch C of serial No. 0021 would not return to its normal open position, and switches C and F of serial No. 0001 would not respond.

b. On August 11, 1982, the chamber head was removed and this anomaly was evaluated and properly dispositioned. Teflon insulated AWG #16 lead wires with Raychem nuclear splices (type WCSF-N with heat-shrinkable polyolefin) were installed, replacing all of the original Kapton insulated type lead wire used inside the test chamber.

c. On August 17, 1982, the second transient ramp and the LOCA/HELB time-temperature/pressure test profile started at 10:30 a.m. Since the first qualification test profile (additional transient-margin ramp) had been run on August 10, 1982, Crosby did not intend to rerun that profile. The second ramp was started with switch C of serial No. 0001 totally inoperable, and switch E of serial No. 0001 actuating with an offset of .065 inch. During the second ramp, the caustic spray was initiated, starting 12 minutes into the profile, and maintained for 24 hours.

At the conclusion of the inspection on August 20, 1982, testing was to be continued for the required 20 days of time-temperature/pressure exposure. At this time, switches C and D of serial

ORGANIZATION: WYLE LABORATORIES
HUNTSVILLE, ALABAMA

REPORT NO.: 99900902/82-09	INSPECTION DATE(S) 8/16-21/82	INSPECTION ON-SITE HOURS: 32

CORRESPONDENCE ADDRESS: Wyle Laboratories
Scientific Services & Systems Group
ATTN: Mr. W. W. Holbrook, General Manager
Eastern Test and Engineering Operations
7800 Governors Drive
Huntsville, AL 35807

ORGANIZATIONAL CONTACT: Mr. E. W. Smith, Director, Contracts and Purchasing
TELEPHONE NUMBER: (205) 837-4411

PRINCIPAL PRODUCT: Research, Engineering, and Test Operations

NUCLEAR INDUSTRY ACTIVITY: Wyle Laboratories, Huntsville, Alabama, provides a variety of nuclear services to the industry, which include environmental and seismic qualification of safety-related equipment, refurbishment and recertification of valves, valve and component flow testing, and mechanical and hydraulic snubber testing, decontamination, and repair.

ASSIGNED INSPECTOR: G. T. Hubbard, Equipment Qualification Section (EQS) — Date: 11/9/82

OTHER INSPECTOR(S):

APPROVED BY: H. S. Phillips, Chief, EQS — Date: 11/9/82

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B.

B. SCOPE: The purpose of this inspection was: (1) to review the Terry Turbine test specification and the Wyle test plan and test procedures; and (2) to witness the dynamic testing of the turbine.

PLANT SITE APPLICABILITY:
Hope Creek Nuclear Station, Unit 1, Docket 50-354; Limerick Generating Station, Units 1 and 2, Docket 50-352/353; Shoreham Nuclear Power Station, Docket 50-322; Susquehanna Steam Electric Station, Units 1 and 2, Docket 50-387/388.

ORGANIZATION: WYLE LABORATORIES
HUNTSVILLE, ALABAMA

REPORT NO.: 99900902/82-09	INSPECTION RESULTS:	PAGE 2 of 6

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Background: The General Electric Corporation (GE) contracted with Wyle Laboratories, Norco, California (Wyle-Norco), to conduct environmental and seismic qualification tests of Terry Corporation's turbine system for the high pressure coolant injection (HPCI) system used in Boiling Water Reactors (BWR). Test requirements were defined in Terry's specification entitled "Environmental Qualification Test Specification for CCS*/HPCI Turbine and Electrical and Mechanical Accessories," EL-20474, Revision 5, dated March 2, 1982. Wyle-Norco wrote its qualification plan based on the Terry specification and entitled it "Final Qualification Plan for CCS/HPCI System and Electrical and Mechanical Accessories for Terry Corporation," Qualification Plan (QP) 57598, Revision B, dated April 20, 1982. Wyle-Norco issued Wyle Laboratories, Huntsville, Alabama (Wyle-Huntsville), an interdivisional contract job order (CJO) for the dynamic test effort described in QP 57598.

2. Test Program:

a. Test Plan:

Dynamic test requirements of Wyle QP 57598, Revision B, required the following tests:

(1) Uniaxial resonance searches;

(2) Biaxial "upset," which includes the random vibration spectrum of an operating basis earthquake (OBE), plus vibration from safety relief valve (SRV) releases and IEEE Standard 323 test margins; and

*Terry designation for "double wheel" steel turbine.

(3) Biaxial "faulted", which includes the random vibration spectrum of a safe shutdown earthquake plus SRV vibration, loss-of-coolant-accident (LOCA) vibration, and IEEE Standard 323 test margins.

Two additional test categories were identified to Wyle in documentation from Mr. J. Kelso of GE. One additional test required was a 7½-minute, biaxial test in each of two horizontal axes to simulate the "SRV aging" that the turbine system would experience during a 40-year plant life. The other test was for a 15-minute, biaxial test in each of two horizontal axes to simulate the effect of "post-LOCA chugging." Since these tests were not included in the documented and approved test plan, Wyle performed them as requested and documented them as test anomalies.

The QP also required the application of forces and moments, per Appendix G-8 of the Terry specification, to "inlet and exhaust nozzles" during all biaxial testing. This requirement was deleted in the original Wyle-Norco interdivisional CJO to Wyle-Huntsville and was considered to be a test anomaly since it was required by the approved QP at the time of testing.

b. System Installation:

(1) Tests were performed on Wyle's biaxial high force seismic simulator with a force rating of 160,000 force pounds in both the vertical and horizontal axes over a frequency range of 1 to 100 Hertz. Maximum displacement of the simulator is 6 inches double amplitude with a maximum transient acceleration of 6 g's.

(2) The turbine system was mounted to the simulator table in such a manner as to represent the attaching mechanism that the turbine system would see in a nuclear plant. The first horizontal axis for testing was defined such that the equipment's longitudinal horizontal axis was parallel to the horizontal axis of excitation. The second horizontal axis was defined as being 90° from the first horizontal axis with rotation being around the vertical axis.

(3) In addition to the turbine system, a nonoperating Woodward electronic control panel was installed separately on the table by a bookend-type attachment fixture. This panel had been

radiation and thermally aged for a 10-year life expectancy. The panel was being subjected to all the QP tests to determine if it could be qualified for a 10-year life. The electronic control panel controlling the turbine system during testing had only been aged for a 5-year life. The 5-year life was in keeping with the predicted life expectancy defined by Woodward, the panel manufacturer.

(4) Also mounted separately on the table was a Nash gland condenser system which prevents steam leakage from the turbine system to atmosphere. The GE representative stated that the unit was not classified as safety-related equipment, but was being tested according to the QP to determine if it could meet the requirements for safety-related equipment. Both the 10-year control panel and the gland condenser system were rotated around their vertical axis, as was the entire turbine system, to provide vibration along both horizontal axes.

(5) Instrumentation for the test included two input accelerometers (one for the vertical axis and one for the horizontal axis) mounted on the table and 24 accelerometers mounted on the turbine system, 10-year aged electronic control panel, and gland condenser system to measure the equipment response. In addition, "contact chatter" detectors were used on contacts where chatter requirements were defined in the test specification. Other instrumentation was provided as appropriate.

(6) Since some of the test sequences required the turbine to be operating during vibration, a 3-inch steam line was provided to the turbine inlet to provide turbine operational capacity. With the steam available, maximum turbine speed obtained was 2400-2500 rpm.

c. Test Results:

Testing was started with uniaxial resonance searches on August 17, 1982, and was completed on August 21, 1982, with a 15-minute "LOCA chugging" test. Turbine system functional operation was demonstrated at required times during the testing and after completion of the final "LOCA chugging" test. During the testing, four test anomalies were identified and were documented by Notice of Anomalies (NOA) per Wyle's QA plan.

The four NOA's are summarized as follows:

(1) NOA concerning the added SRV, "LOCA chugging," additional resonance searches, and change in test sequencing per written GE request.

(2) NOA concerning the deletion of nozzle loading requirements during vibration testing.

(3) NOA documenting limitations of Wyle's steam and its effect on turbine system operation. Two items were identified and are as follows:

(a) During OBE quick start demonstrations, the turbine speed was approximately 700 rpm prior to the quick start signal. Final turbine speed obtained following the quick start signal and just before the end of vibration input was less than 2000 rpm. Even though turbine speed did not reach Wyle's previously demonstrated steady-state no-load speed of 2200-2400 rpm, the test was considered acceptable since the turbine system demonstrated quick start control capability considering the limitations of Wyle's steam system.

(b) Wyle was required to perform a functional check of the turbine system which included taking oil pressure readings. Acceptance criteria for oil pressure was defined as a minimum of 100 psi at 4000 rpm turbine speed. Since turbine speeds of 4000 rpm could not be obtained with Wyle's steam system, oil pressure readings were taken at 2200-2250 rpm. Oil pressure readings recorded were 95-97 psi. Since oil pump performance data was not available for the obtained turbine speed, GE will have to address the question in their final turbine system qualification package. This matter is considered a followup item and will be reviewed at the next inspection of GE, San Jose, California (8209-01).

(4) NOA documenting added bracing to components of the turbine system. Three areas of added bracing are as follows:

(a) The oil feed line to driven equipment was braced with angle iron prior to any testing at Wyle.

(b) The oil supply tubing to the turbine overspeed trip system normally is braced, but the system provided Wyle for testing was not braced. After initial testing in the first horizontal axis, the tubing was taped together to provide support.

(c) Prior to the start of the LOCA chugging tests, the tubing between the hydraulic actuator and servo was taped to prevent vibration.

Since items (b) and (c) above were braced in a temporary manner, they are considered as a followup item and will be reviewed at the next inspection of GE, San Jose, California (8209-02).

3. Inspection Results:

The NRC inspection was accomplished by interviewing Wyle, GE, and Terry personnel, review of documentation and test data, and observations of test operations. The results of the inspection performed are as follows:

(a) The dynamic sections of the Wyle test plan were in accordance with the GE-approved Terry test specification.

(b) The testing of the Terry turbine was tested in accordance with the Wyle test plan and documented test changes as provided by GE.

(c) Two test anomalies were identified, documented, and properly dispositioned.

(d) Two test anomalies were identified, documented, and properly dispositioned by Wyle, but required analysis by GE; therefore, they are considered followup items.

(e) No instances were found where the requirements of NUREG-0588, Revision 1, or IEEE Standard 344-1975 were not met.

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